INDUSTRIAL MEDICINE

Industrial Health, Occupational Medicine and Traumatic Surgery

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Preventive Medicine
— In Engineering Education —

Low Back Pain
— A Different Cause and Treatment —

Tropical Diseases
— In Industry —

Thioglycolic Acid and Thioglycolates
— Action on Animals after Subcutaneous Introduction —

Scrotal Swellings
— In Industrial Medical Practice —

Laceration of the Liver
— Discussion and Case Reports —

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— Eleventh Annual Meeting, Industrial Hygiene Foundation —

Accidental Propaganda
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Volume 16 Number 2

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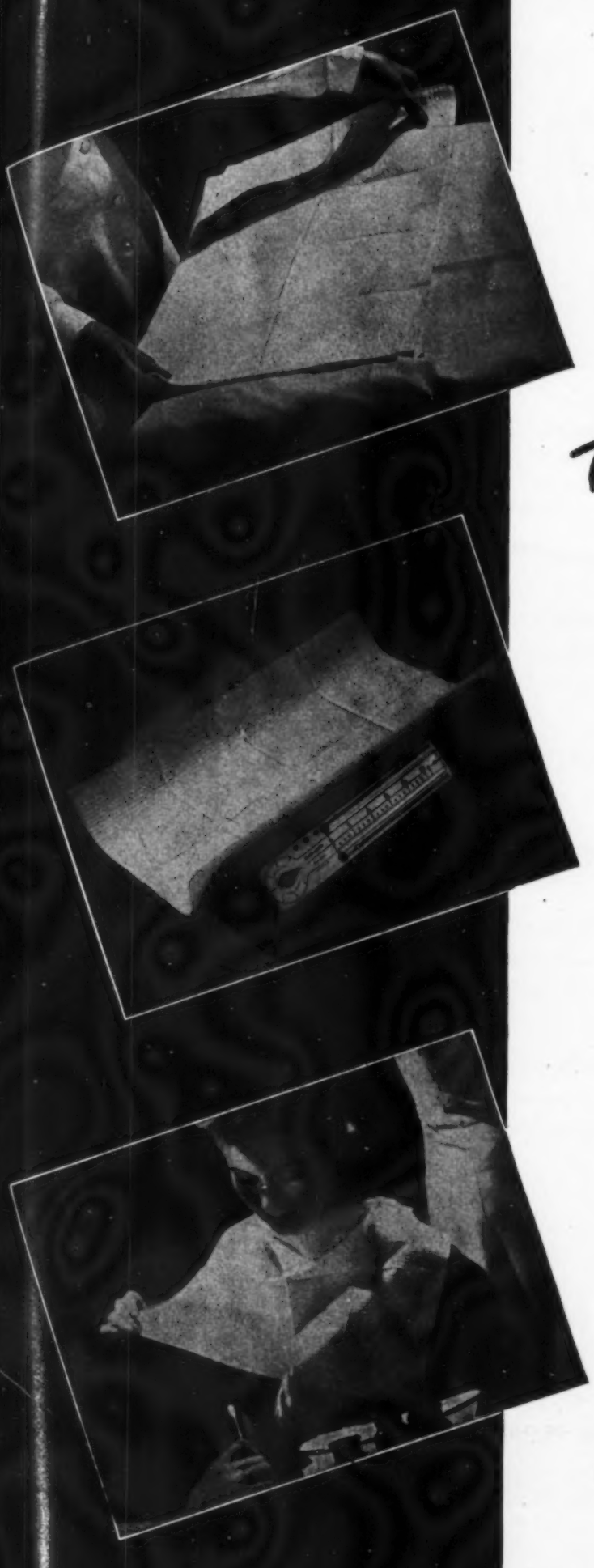

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NEWS, Comment and Opinion this month (page 96) has some pungent remarks on current matters. "The Whole Man" (page 100), "Mine Doctors" (page 101), "The Career Angle" (page 103), "Communism in the War Department" (page 104), and "Cook County Health Survey" (page 106) are particularly interesting—the latter with special relation to the editorial (page 69). And the "News" offers a tentative preview of the Buffalo Conference, April 29-May 3 (page 106). . . . THE item "From the Newspapers," on page 106, quotes *New York Herald Tribune* to the effect that the American Medical Association's Eighth Annual Congress on Industrial Health will be held in Detroit, October 8-10, 1947. . . . AND now a final call for our "Who's Who in Industrial Medicine." If there's a questionnaire still unanswered, or a proof still uncorrected or approved, it should be returned at once. This forthcoming volume will have many values, and not the least will be its *historical* interest. . . .

The Buffalo Conference

American Association of Industrial Physicians and Surgeons
Thirty-second Annual Meeting
American Association of Industrial Nurses
Fifth Annual Meeting
American Industrial Hygiene Association
Eighth Annual Meeting
American Association of Industrial Dentists
Fourth Annual Meeting
National Conference of Governmental Industrial Hygienists
Ninth Annual Meeting

Buffalo, New York—April 29-May 3, 1947

Program Features:

1. The Bikini Experiment—phases of the atom bomb development of special interest to physicians and hygienists.
2. Medical and Surgical Clinics.
3. The Teaching of Industrial Medicine in Medical Schools.
4. Scientific and Professional Papers, and Discussions.
5. Round-Table Conferences.
6. Technical and Scientific Exhibits.

INDUSTRIAL MEDICINE, The Journal of Industrial Health, Occupational Diseases and Traumatic Surgery. Entered as second class mail matter August 28, 1941, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879. Published on the fifth of each month by INDUSTRIAL MEDICINE PUBLISHING COMPANY, Chicago (publishers also of INDUSTRIAL NURSING, issued monthly, and AMERICAN INDUSTRIAL HYGIENE ASSOCIATION QUARTERLY). STEPHEN G. HALOS, President; A. D. CLOUD, Publisher; C. O. SAPPINGTON, M.D., DR. P.H., Editor; CHARLES DRUECK, JR., Secretary and Treasurer; STEPHEN G. HALOS, Advertising and Business Manager. Member, Audit Bureau of Circulations. PUBLICATION, EDITORIAL and EXECUTIVE Offices: 605 North Michigan Avenue, Chicago 11, Illinois. Subscription $5.00 per year in the United States; $5.50 per year in Canada; $6.00 per year in other countries. Single copies 75 cents. Title Registered in United States Patent Office.

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DR. PILGRIM

AT THE desk reading transcripts of legal procedure, many reports and laws, and final notes; and later listening with great interest to the broadcast by "Reader's Digest" of "The Man Who Opened the West," being an excerpt from the experiences of old DOCTOR JOHN SAPPINGTON, who introduced quinine into the Mississippi Valley, and who was greatly derided by the members of the profession for using the drug instead of the customary technique of bleeding, and PILGRIM reminded of the pioneering spirit which apparently still persists in the line; and as a part of the holiday activities, bowling with Madame Pilgrim in an effort to settle some of the viands of the holidays, and having mixed emotions with regard to the scores. . . . AND concerned again with many reports and studies with regard to problems of prevention, as well as those of medicolegal import, at the year's end, and taking some delight in going over the year' esxperences, noting with pleasure that progress has been made. . . . AND on New Year's Day at work with notes on some future presentations, and the while listening to the broadcasts of the Rose Bowl Game with some delight at University of Illinois being able to show Californians that football was not restricted to territorial boundaries; and thence to the home of the KALMES for libations, music and converse. . . . AND delighted at receiving from time to time letters from Bert Hanman on his European trip, in connection with his letters to "Dear Charlie," and noting that much progress has been made in international relationships besides those specific advances in international studies on job placement... AND concerned with various problems with reference to The Ramazzini Society, especially in the selection of the place for the annual meeting and the

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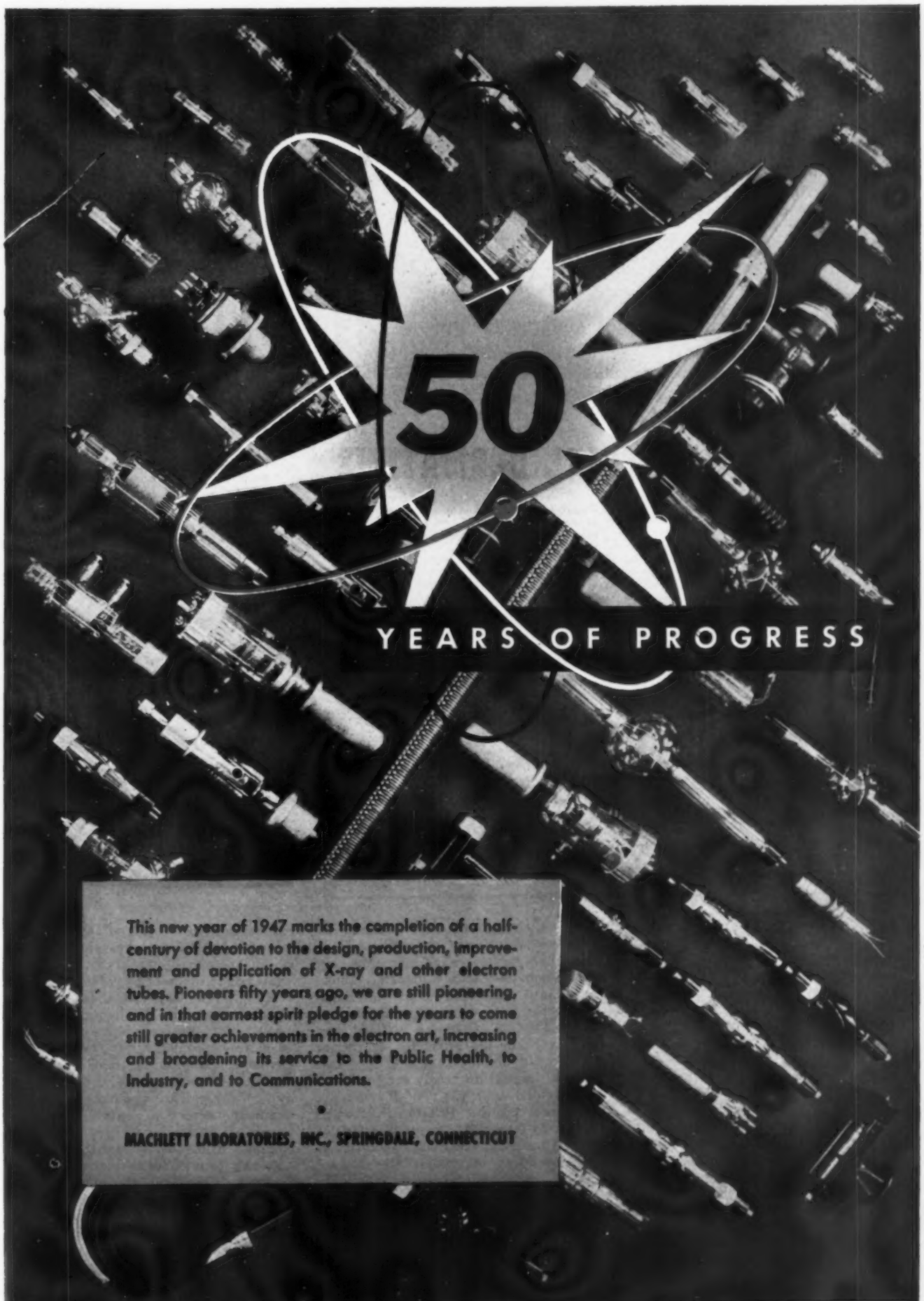
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(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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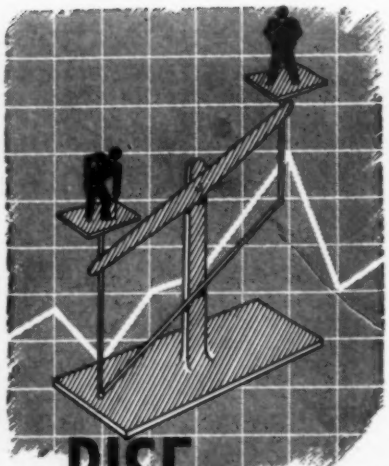

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*Spockman, E. W. et al: Am. J. M. Sc., 202:68, 1941.

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orator, as well as sending out a letter to the members. . . . AND again to the compensation commissions for hearing, in which it was evident that there should be more cooperation and understanding between attorneys and physicians with respect to technical points—albeit that much more attention should be paid to these things by those who conduct proceedings. . . . AND in between these various problems, at the desk with many manuscripts and reports and occupied with matters of engineering techniques and organization. . . . AND then to the DUNNS for an evening of music, whereat little ROSELLA-JEAN and PILGRIM played duets, and later there was much exchange of coin and paper, resulting from the counting of spots. . . . AND reading in the column of Old Doctor Brady (as he calls himself) to find that he is much surprised at the credulity of a lawyer who wrote to him with respect to cholesteremia and an engineer who wrote about the effects of carbon dioxide, when he meant carbon monoxide; and wondering about physicians concerned about the credulity of the laity when it is emphasized so much that unless a patient has confidence in his physician, optimum results will not be achieved. . . . AND pleased indeed to learn that a long-time friend, BILL YANT, of Pittsburgh, has received the Pittsburgh Award given by the Pittsburgh Section of the American Chemical Society, at the bestowal of which there were many notables present including ROYD R. SAYERS, GEORGE H. DEIKE, H. V. CHURCHILL, H. E. LONGENECKER, JOHN T. RYAN, JR., ARNO C. FIELDNER, and ALDER H. EMERY; and greatly impressed by DOCTOR YANT'S acceptance, particularly when he said in part: "There is no field of endeavor that demands better trained men, closer cooperation among professions (in discussing industrial hygiene). There is much overlapping of interest and knowledge; in fact, a professional hybrid is more essential than a pure-blood professional—a doctor of medicine-chemist-engineer cross or a chemist-engineer-toxicologist. Doctors of medicine must think more in terms of industrial processes and procedures and of chemical, physical and mechanical factors of environment instead of bacteria, viruses, and the common ailments of mankind". . . . AND now to a series of luncheons with important conferences, among them with THEODORE HATCH, WARREN COOK and LLOYD GORDON, with much to say about dust findings, and on the same day attending the regular monthly dinner meeting of the Chicago Section of the AMERICAN INDUSTRIAL HYGIENE ASSOCIATION, where MR. HATCH

—*Continued on page 106.*

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THE object of this Association shall be to foster the study and discussion of the problems peculiar to the practice of industrial medicine and surgery; to develop methods adapted to the conservation of health among workers in the industries; to promote a more general understanding of the purposes and results of the medical care of employees, and to unite into one organization members of the medical profession specializing in industrial medicine and surgery for their mutual advancement in the practice of their profession.

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PERSONAL

FRED WAMPLER, M.D., of Richmond, Virginia, has been named Director of the Page-Warren-Shenandoah Health District, Virginia State Department of Health.

HAROLD T. CASTBERG, M.D., has resigned as Chief of the Bureau of Adult Health to become Director of Field Investigations for the U. S. Public Health Service, Industrial Hygiene Division, Bethesda.

WILLIAM L. COOK, JR., M.D., has been appointed Assistant Director of the Department of Industrial Hygiene, University of Pittsburgh. DR. COOK was Assistant Director and later Director of the Occupational Health Division, Office of the Surgeon General, U. S. Army, during World War II.

DR. W. A. MORRISON, a member of the Santa Fe railroad's medical department for the last 25 years, has been appointed to the newly created position of medical director. He will coordinate the work of Santa Fe's physicians and nurses and supervise protection of the health of about 68,000 employees.

DR. LYMAN D. HEACOCK, formerly chief of the Dental Section, Industrial Hygiene Division, U.S.P.H.S., has accepted the position of Chief, Research and Training Section, Dental Division, Veterans' Administration, with headquarters in Washington. DR. HEACOCK initiated the industrial dentistry program when he entered the Service in 1942, and, during the past four years, while chief of the Section, has accomplished much in that field. He drew up the standard of procedure for successful dental programs in industry which was approved by the American Dental Association. To him also goes the credit for the organization of the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS. His immediate work at the Veterans' Administration is concerned with the program on post-graduate education for dental officers.

DR. H. G. S. VAN RAALTE, Chief Medical Officer, C.P.I.M., Curacao, N.W.I., author of several articles in INDUSTRIAL MEDICINE ("Methyl Chloride Intoxication, September, 1945; "Traumatic Rupture of Cardiac Valve," July, 1946) writes as follows: "I was promoted to Doctor in Medicine at the University of Leyden (Netherland) November 20, 1946, on a dissertation, 'The Infectious Hepatitis.'"

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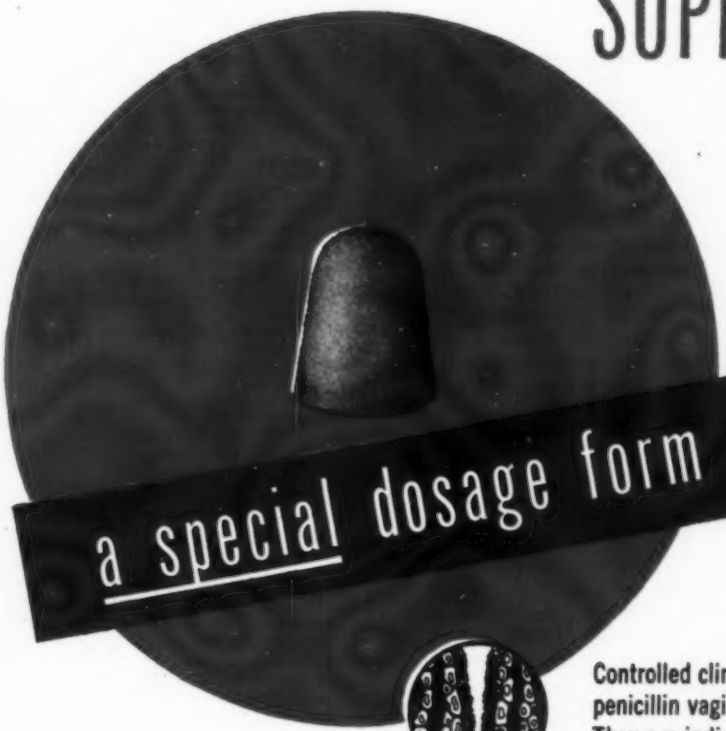

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DR. WILLIAM PARKS YANT, Director of Research, Mine Safety Appliances Company, and internationally known for research in safety and health, was chosen the 1946 recipient of the Pittsburgh Award, bestowed annually by the Pittsburgh Section of the American Chemical Society for outstanding service to chemistry. "Dr. Yant has contributed prolifically to science, industry and welfare" said the announcement by Dean Herbert E. Longenecker of the Graduate School of the University of Pittsburgh, chairman of the section. "Every activity of his has directly benefitted humanity by improving health, reducing suffering, and raising the general economic level." In 1919 he joined the U. S. Bureau of Mines, becoming chief chemist of the health division, and supervising engineer of the Pittsburgh Experiment Station. During this association, he earned an international reputation for his knowledge of safety and for his vigorous researches. He became Director of Research of the Mine Safety Appliances Company in 1936 where he has developed many new instruments and safety appliances used throughout industry and in the Armed Forces.

DR. RICHARD A. SUTTER was formally installed on January 8 as the new president of the St. Louis County Medical Society. . . . Youngest man ever to be elected to the society's presidency, DR. SUTTER is also the first son of a former president to hold the office. His father, the late DR. JOHN H. SUTTER, was society president in 1932. The new head of the medical group is a member of the staffs of the Deaconess Evangelical, Lutheran and Alexian Brothers Hospitals and is a specialist in industrial surgery. He is also division surgeon of the Chicago, Burlington & Quincy Railroad. After the war, DR. SUTTER was in charge of all German hospitals in the American zone of Austria. This "marks the first time an Industrial Surgeon has been granted such recognition. It represents evidence of a betterment of feeling toward 'Industrial Doctors' held by the general profession."

DR. RICHARD W. BURGER has been appointed full-time plant physician at Joseph S. Finch & Co. at Schenley, Pennsylvania. The company announces plans for an expanded employes' medical program, part of an over-all policy of Schenley Distillers Corporation covering Finch and other major affiliates. Finch's present two dispensaries are to be consolidated into a single hospital unit with modern facilities. Consisting of four rooms, it will provide space for waiting quarters, examinations; physiotherapy and emergency treatments; operating table, beds, supplies and an office for DR. BURGER and six nurse assistants. In addition, a first aid room

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Published under supervision of the Ways and Means Committee of the New York State Society of Industrial Medicine. Editorial office, F. E. REDMOND, Managing Editor, 361 Delaware Avenue, Buffalo, N. Y. Articles herein do not necessarily reflect the opinion or policy of this journal nor of the New York State Society of Industrial Medicine.

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and ambulance service will be maintained. Already in effect under the new physician's direction are complete pre-employment examinations. These will be followed later by periodic physical examinations for all personnel. "We will take care of industrial accidents and emergency illnesses at our plant, but will refer all other cases to physicians in the community," DR. BURGER stated. These activities are under the supervision of DR. ADOLPH G. KAMMER, New York, general medical director for Schenley Distillers Corporation. DR. BURGER was a captain in the Army Medical Corps during World War II, serving 26 months in the E.T.O. He was born in Cokesburg, received his M.D. at the University of Pittsburgh, and served a one-year internship at McKeesport.

MEDICAL DIRECTOR JOHN W. CRONIN will head the Federal Employee Health Division, recently created within the Bureau of Medical Services. Formerly Medical Officer in Charge of the U. S. Public Health Service Dispensary, Washington, D. C., DR. CRONIN has for some time been active in the employee health field. The new Division will develop standards and policies for, and conduct studies and prepare analyses of, Federal employee health programs; provide consultative services to the heads of departments and agencies of the Federal government, including government-owned and -controlled corporations; review and appraise, upon proper request, Federal employee health programs already under way; and contract with departments and agencies of the Federal government for the operations of such programs. DR. CRONIN'S new duties will make full use of his experience in psychiatry, industrial medicine, surgery and administration during the past 14 years. A graduate of University of Cincinnati College of Medicine, he entered the U. S. Public Health Service in 1932 and interned at the U. S. Marine Hospital at Stapleton, Staten Island during 1933. Subsequent assignments brought him in touch with many types of public health work. He served as Chief Medical Officer at several Federal and penal and correctional institutions, at quarantine stations along the coast, at sea with the Coast Guard as part of the Arctic Ocean and Bering Sea Patrol Force, and at marine hospitals. He also was assigned for postgraduate training in psychiatry at the Colorado Psychopathic Hospital in Denver in 1937. During the war, he was Executive Medical Officer for the U. S. Coast Guard Training Station at Manhattan Beach and also for the U. S. Maritime Training Station at Sheepshead Bay. Before being assigned to the Dispensary in Washington, he held the position of Assistant Chief of the Hospital Division at Public Health Service headquarters.

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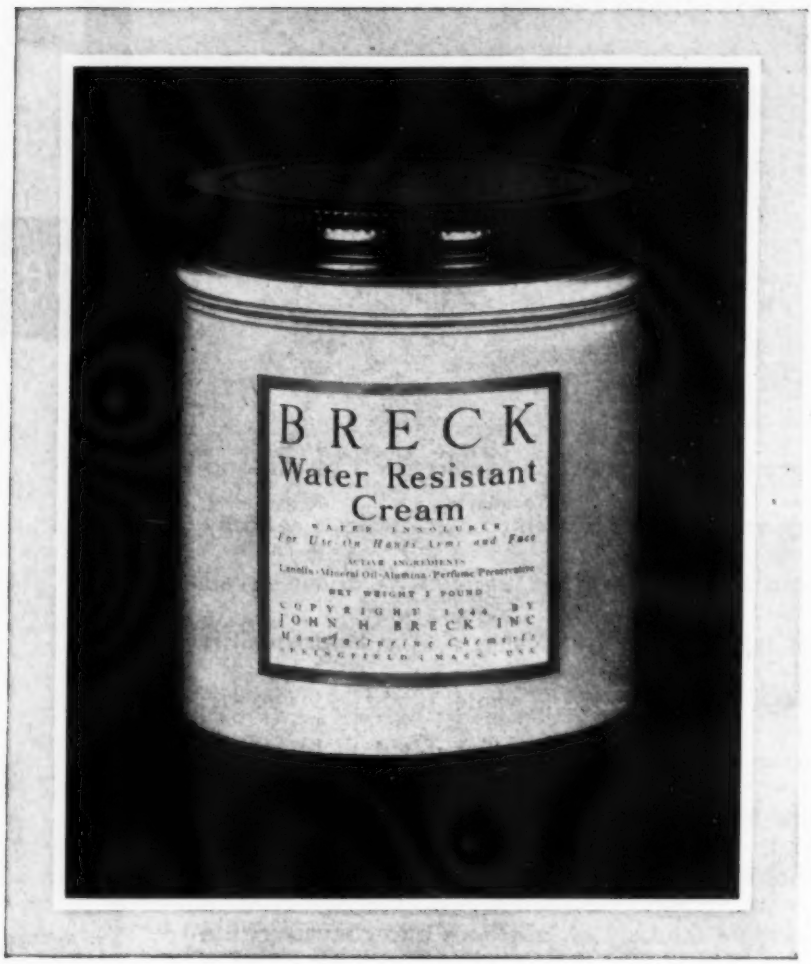

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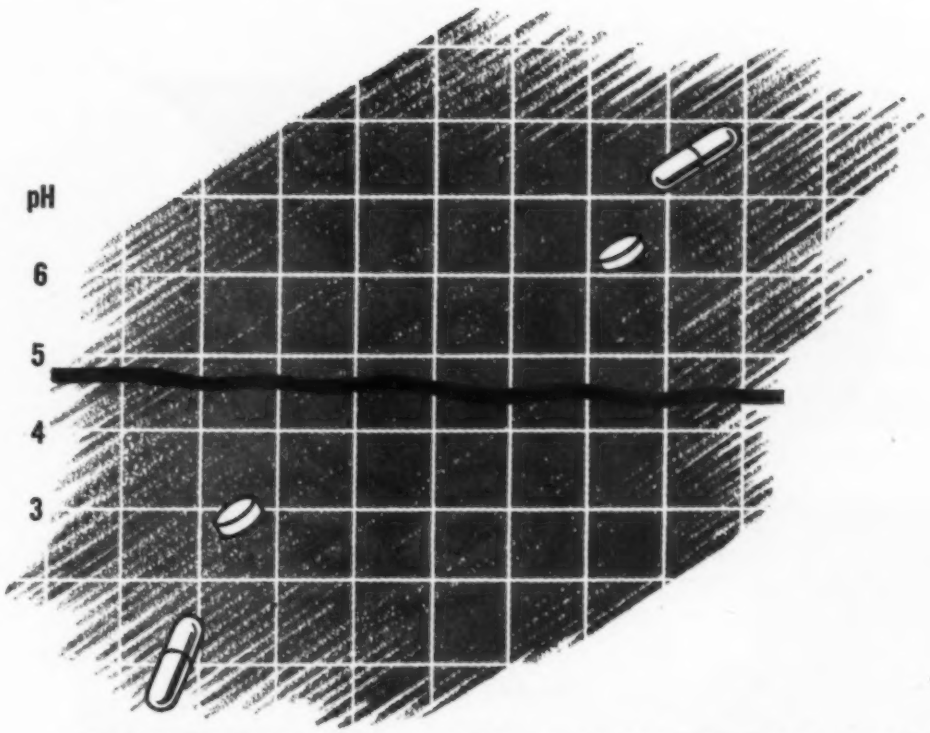

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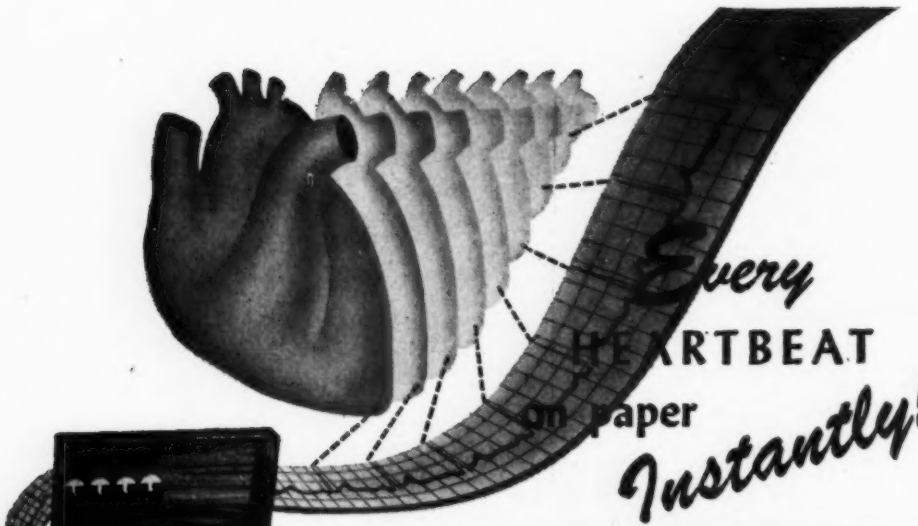

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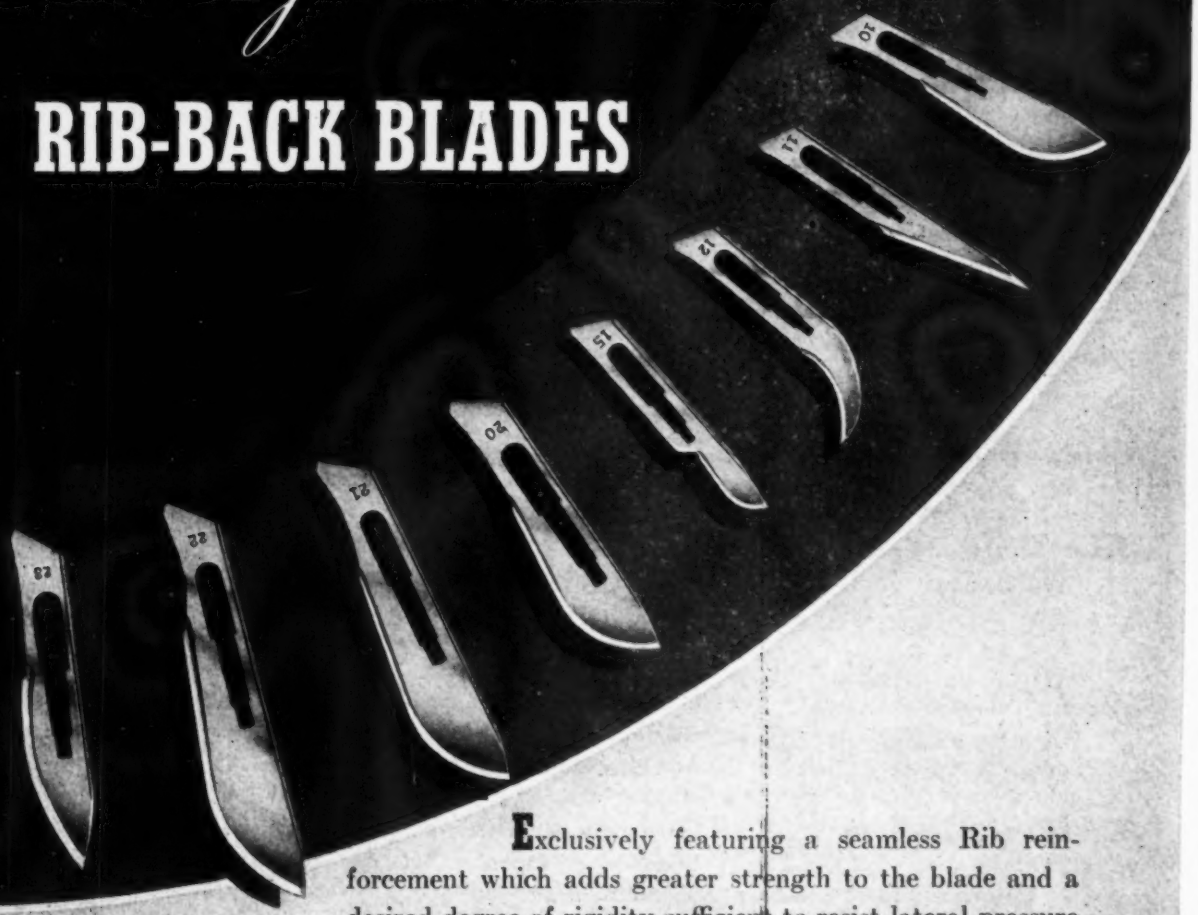

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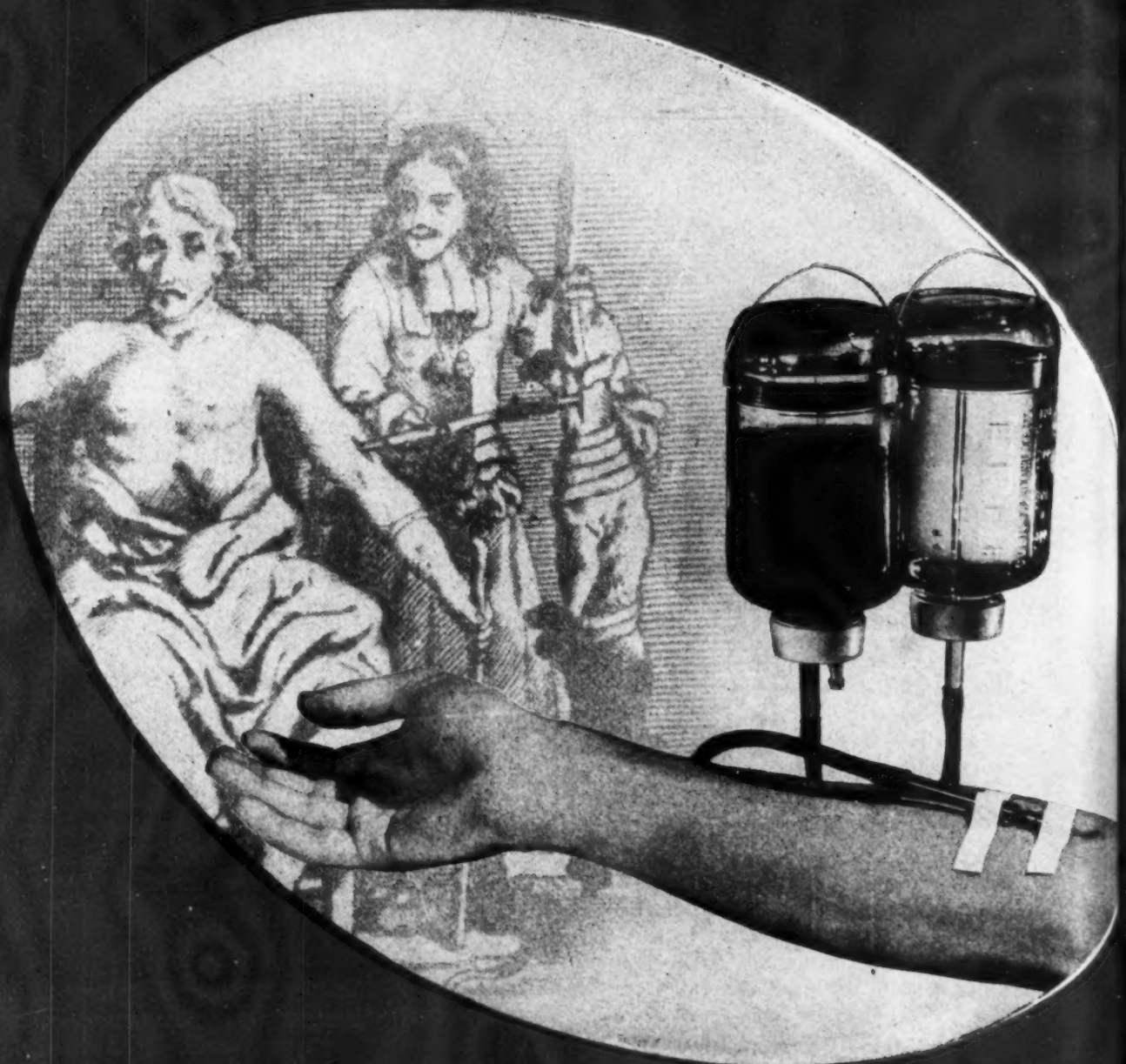

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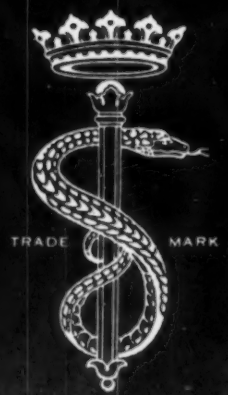

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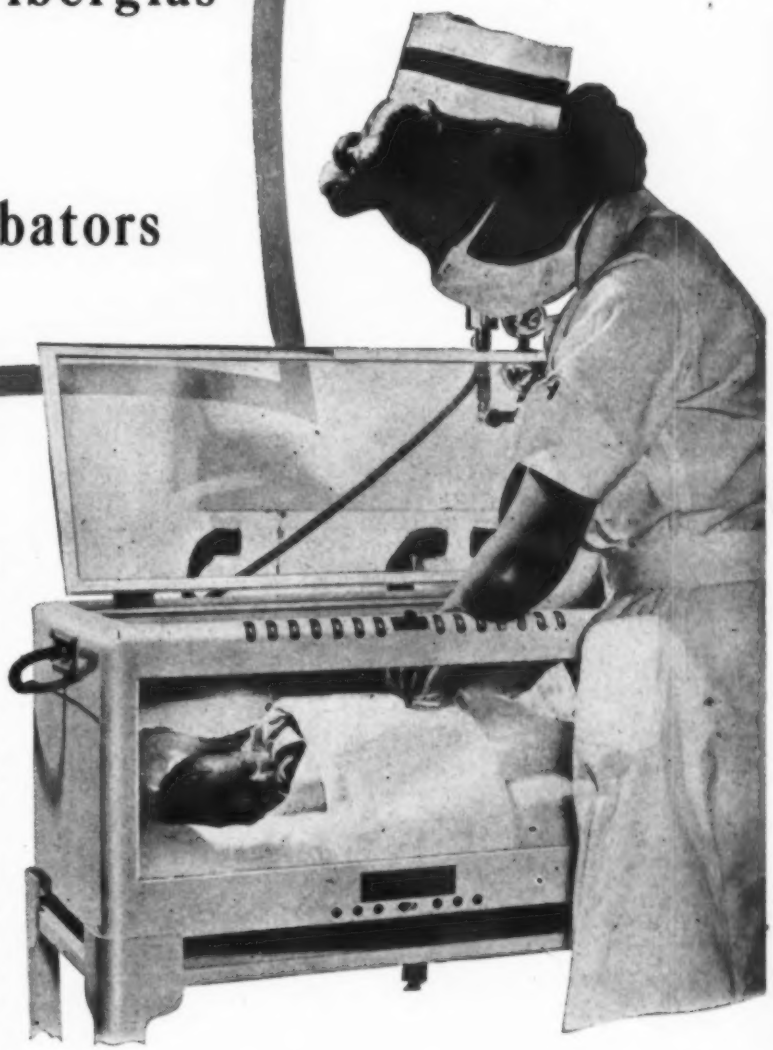

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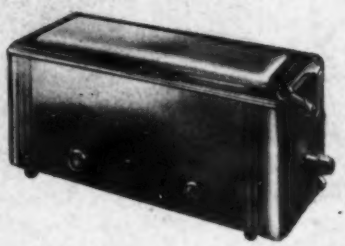

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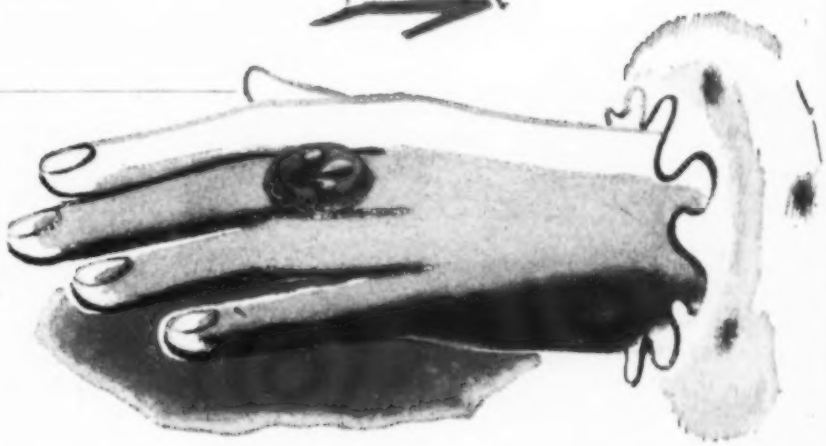

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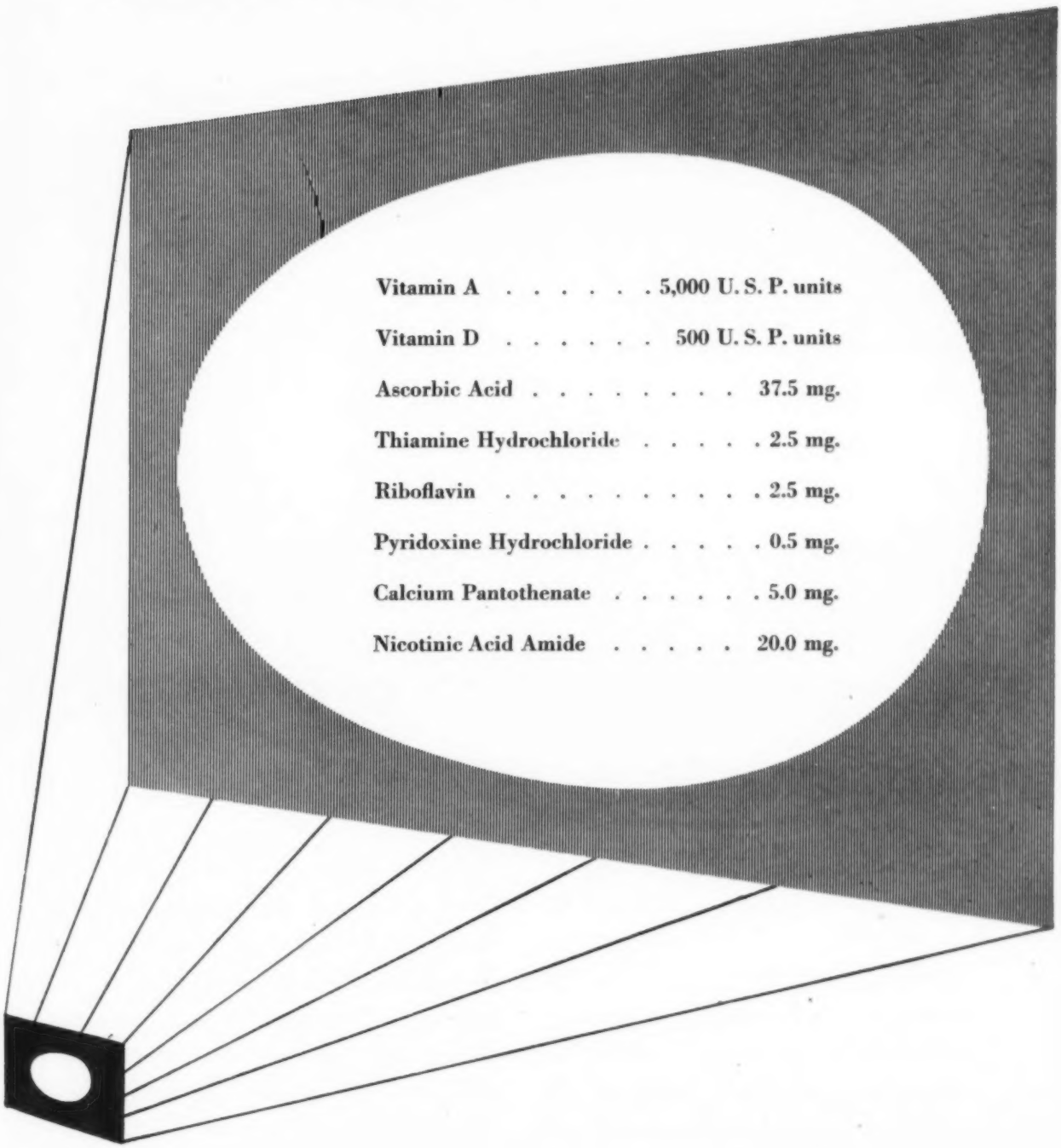
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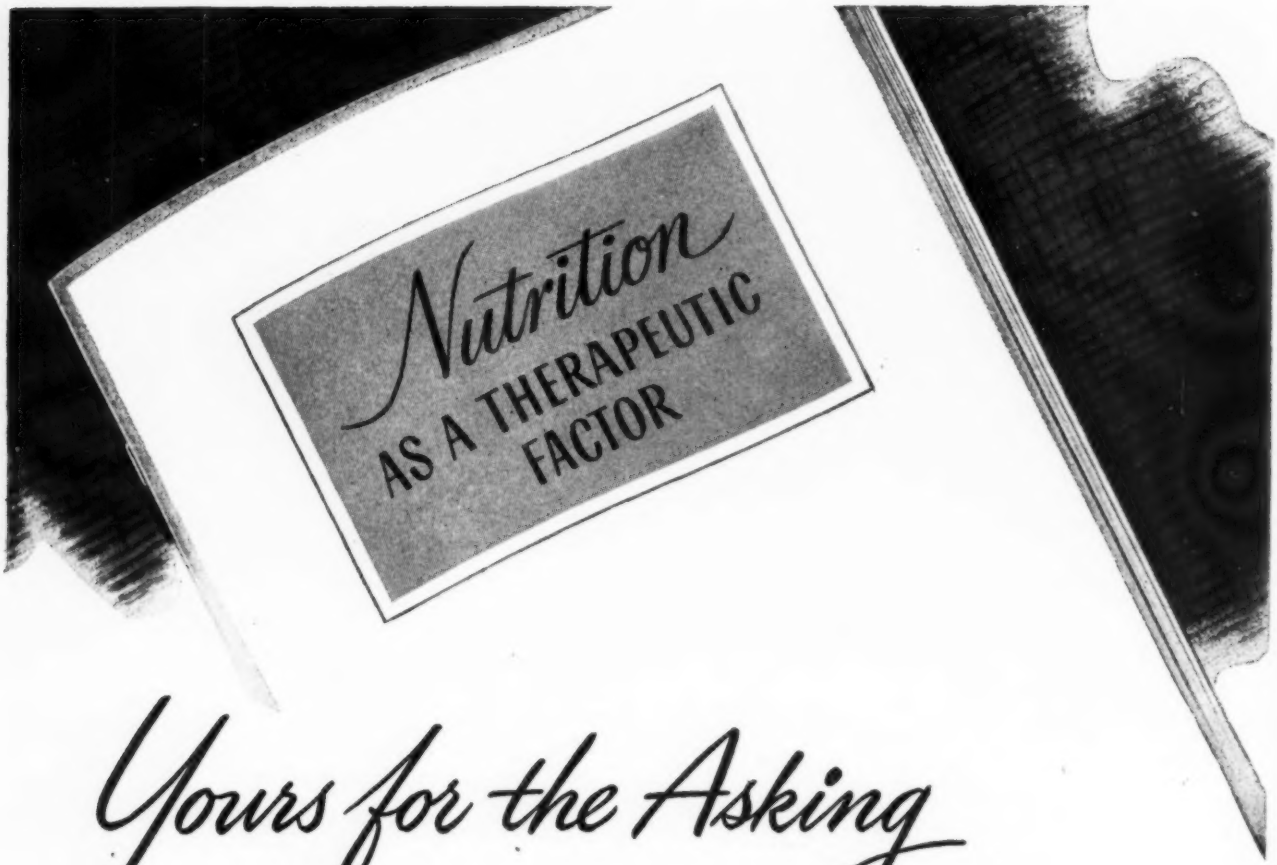

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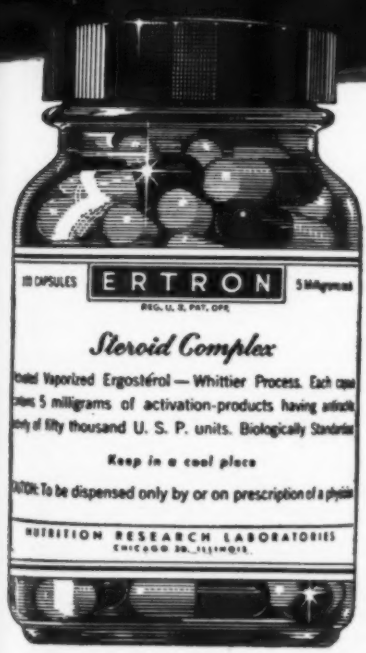

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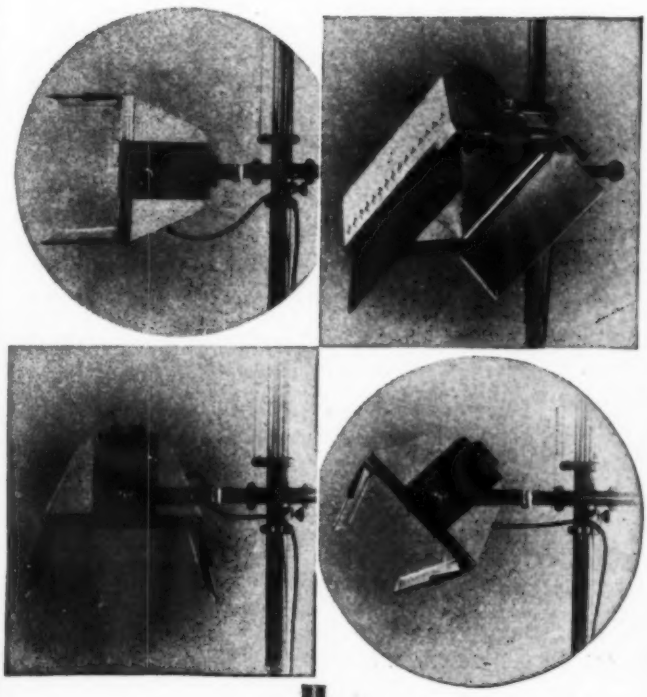

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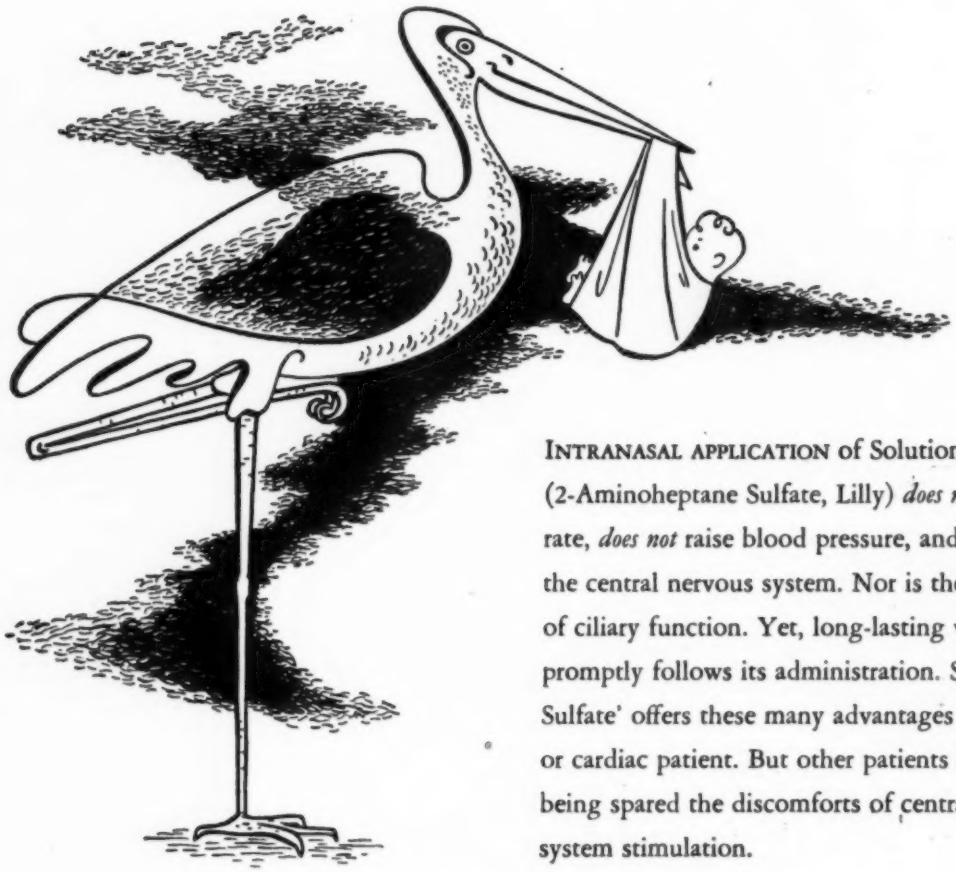

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With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 16 | February, 1947 | Number 2

Tropical Diseases in Industry

Z. TAYLOR BERCOVITZ, M.D.,
Assistant Clinical Professor of Medicine,
New York Post-Graduate Medical School,
Columbia University,
Instructor in Medicine, Cornell University Medical College,
New York, N. Y.

MUCH has been written on the problems of tropical diseases relating to industries having personnel in tropical areas and the efforts to prevent implantation, spread and propagation of tropical diseases in the United States. The return to industry of veterans who have contracted tropical diseases brings many new problems in addition to those already well known to industrial physicians.

These problems of returning veterans or personnel with tropical diseases may best be considered by answering the following questions:

1. What is the possibility of spread of tropical diseases to fellow workers by returning infected veterans?
2. Will these veterans become liabilities to the companies employing them?
3. What are the problems of diagnosis and therapy which may be expected to arise during the course of their employment in the plant?

Spread of Tropical Diseases

IT CAN be stated that few, if any, of the tropical diseases which our men have contracted overseas can be transmitted to friends, relatives or fellow workers by contact in the normal relationships of factory, office or home.

Tropical diseases, as a group, require for their transmission to another person vectors, such as the mosquito, flies of various types, fleas, lice, ticks, etc., for development of infective forms. Thus filariasis, dengue, malaria, African sleeping sickness, the typhus fever group are examples of diseases transmitted by insect vectors.

It is true that in the case of malaria the parasites may be transferred by blood transfusions, but this is not part of the plan of daily relationships of people at work.

Furthermore, the development and propagation of malarial anopheline mosquitoes and the parasite within the insect are dependent upon very definite temperature and humidity requirements which are present seasonally in only relatively small areas of the United States. In hookworm and other intestinal parasitic infections, time for development of the ova into infective forms of the parasite and the proper conditions for infection of the new host must prevail; in amebic or bacillary dysentery, food handling by unsanitary persons is a factor; in dermatomycotic infections, transmission occurs in showers and bathing places or from towels, but most people are aware of this problem and precautions are taken to prevent such spread.

Leprosy should be mentioned because of the misconception by the laity that any skin condition from the tropics may be leprosy. This is erroneous: in the first place a person with leprosy would not have been discharged from the service, in the second place the disease is rare, and finally it is generally conceded that prolonged intimate contact is necessary for its transmission.

It may be stated that, bearing in mind the manner of spread of tropical diseases, there is no reason for excluding a person who has had a tropical disease from a plant, for he constitutes no danger to his fellow workers in office or factory, provided he is under supervision and the physician is alert to the development of recurrences of infection.

Liabilities

THE treatment program of the armed forces which involves prolonged periods of observation and convalescence before discharge, almost precludes the possibility of serious complications. It is true that there may be the complications of amebic or bacillary dysentery, such as amebic abscess of the liver or chronic forms of colitis; and that we do not know what are the after-effects of infectious hepatitis. The complications of falciparum malaria fortunately are most unlikely after adequate atabrine therapy. It should be mentioned at this point that most of the relapsing malarias are vivax infections. Filariasis patients do not constitute a special risk group if they are placed in employment that does not involve heat and humidity. Recurrences or activation of filarial infection usually occur in occupations involving these conditions.

Presented at the Thirty-First Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Chicago, 1946.

Returning veterans with tropical diseases, in general, do not constitute any greater risk to the corporation as permanent liability than the average employee. It is true that some may have recurrences of their malaria or dysentery or other conditions, but these may be handled with therapeutic measures to be considered later in this discussion.

Most important is our attitude toward these men. It must be remembered that they have been through great trials and stress and strain. If they have had a tropical disease, or, for that matter, any other condition, they should be treated as any other patient. Their period of adjustment may be prolonged, and they may seem restless and unduly concerned about themselves. Many will have attacks of diarrhea which will prove neurogenic in origin. In such cases the patient should be reassured, allowed to unload his worries or imagined worries and made to understand that he does not have gross organic disease.

Careful study must be made, for so deep-seated are the concerns of these men, that nothing superficial will convince them that they are well. They should not be pampered, for that is not what they want. What is necessary is a frank discussion of the problem with the patient after careful study has proved that no disease is present. This part of the rehabilitation of the patient should be done by the industrial physician who is normally responsible for the welfare of the patient. Let us not convert these men into mental invalids by involved psychotherapeutic practices, when a little common sense coupled with a bit of sympathy and understanding is all that is required.

Veterans who have had malaria from which they are considered recovered, have "chills" which in many ways will simulate the genuine chill of malaria. Such men will require careful study and the same thoughtful handing as should be accorded all veterans with recurrences of symptoms related rather to worry and concern than to actual infection. It must be remembered, however, that it is not unlikely that in many instances true symptoms of complications will be encountered.

Diagnosis and Treatment

IT IS the intention in this discussion to consider from a practical standpoint the diagnosis and treatment of those tropical diseases most likely to confront the physician in the plant office. Although numerous conditions are of academic interest, such as infective hepatitis, fungus infections, leprosy, dermatosis, certain nutritional diseases, the rickettsial and virus, spirochetal diseases, only amebic and bacillary dysentery, malaria and conditions due to helminths will be considered in this discussion, for these are by far the most common to be encountered in the normal routine of the plant physician.

Amebic and Bacillary Dysentery

AMEBIC and bacillary dysentery are the most common forms of the dysenteries. Their differential diagnosis is of the greatest interest here.

Symptomatology: Bacillary dysentery is usually of sudden onset with straining, tenesmus, diarrhea, up to 20 or more times daily, with small amounts of blood and pus intimately mixed. The patient is toxic, feverish and a very sick man within an amazingly short time after the onset. On the other hand, amebic dysentery starts slowly with an insidious onset and with only five, six or eight copious bowel movements daily with large quantities of mucus frequently blood streaked. Toxemia is absent, and there is no straining nor tenesmus; the evacuations are easily passed and the patient is quite comfortable after each bowel movement. Not infrequently both infections may be coincidental, and while not common it can happen, and did happen in our experiences in India. Under such conditions, the predominant clinical picture is that of the more violent disease of bacillary dysentery, after the subsiding of which under proper therapy the parasites of Endamoeba histolytica may be found.

Sigmoidoscopic examination: The acutely inflamed bowel mucosa with edema and adhering mucus and pus, as well as ulcerations which are large, ragged, and dirty are typical of bacillary dysentery. The appearance of the bowel in amebic dysentery is entirely different in that there are discrete punched-out ulcers with raised edges, and the intervening mucosa is relatively normal. In mixed infections the appearance of the bowel may be that found in the more acute process. In chronic amebiasis there are occasionally no findings in the rectum and sigmoid if the disease is higher up in the colon, or there may be an amebic granuloma which appears as a thickened mass, usually a ring of edematous tissue not unlike an early annular carcinoma. In these cases the stool examination may be negative for amebae, and the only means of accurate diagnosis is by biopsy. Other causes of diarrhea must be excluded, including polyposis, carcinoma and idiopathic chronic ulcerative colitis, lymphogranuloma venereum.

Complications: Amebic dysentery may become chronic with recurrences of attacks of diarrhea due to improper or insufficient treatment of the first attack, repeated reinfections, or secondary bacterial infection. Other complications include perforations in which the infection goes through to the peritoneal reflection of the viscus and results in thickening of the bowel wall; amebic granulomata, especially of the rectal sigmoid area or of the coecum extending up to the first portion of the ascending colon; amebic typhilitis and appendicitis; amebic hepatitis and amebic abscess of the liver. Other secondary effects may be perforation of an amebic liver abscess through the diaphragm into the right pleural cavity, amebic perisplenitis, and such rare conditions as amebic abscess of the brain, amebic perforation of the splenic flexure of the colon involving at the same time spleen, left diaphragm and left lower lobe of the lung; one rare case observed involved the liver, right lower lobe of lung and pericardium, and was secondarily infected with pneumococci and streptococci.

Bacillary dysentery is complicated most commonly by developing into a chronic ulcerative colitis. Arthropathies of various types occur affecting most frequently the large joints, although the joints of the hands and feet have been seen to be involved. Conjunctivitis has been observed not infrequently.

Diagnostic Methods: Microscopic examination of the freshly passed, warm specimen is of vital importance in finding motile trophozoites of E. histolytica. Cysts also may be seen and, in addition, an evaluation can be made of the cellular exudates of the bowel discharges. Wherever possible the patient should go to the clinic or laboratory and pass the specimen at the time of examination. A dose of Eysom salts calculated to give a mushy movement is of great value. In fact, it has been estimated that the chance of making a positive diagnosis is 75% greater if Epsom salts are used.

One important point should be borne in mind, namely, all of the evacuations following the salts must be studied, and after the patient has passed the

movements without difficulty, he should be encouraged to strain to evacuate the terminal bit of mucus that frequently comes down and which usually contains amebae when the other specimens may be negative.

The use of Lugol's solution or D'Antoni's iodine mixture is of invaluable aid in the identification of species in fresh preparations. Fixed stained preparations are of value for more detailed study and permanent record. Often fixation and staining are required to properly evaluate the type of cysts.

In freshly passed preparations, the character of cellular exudates is significant. In simple amebic dysentery, there are essentially no cells of tissue origin and no polymorphonuclear leucocytes. In bacillary dysentery, there are large numbers of pus cells, endothelial macrophages, round cells; when the infection is serious or with evidence of toxicity, these cells may be swollen with ringed nuclei and toxic granules. The macrophages are the most prominent cells, being large, up to 150 microns, and with a prominent nucleus. They are frequently mistaken for "rounded out amebae" because of their size and prominent nucleus. The main differential points are that they do not have progressive motility as do the trophozoites of E. histolytica, and in the latter the nucleus is very rarely if ever seen in the freshly passed, unstained specimen.

At times there is a mixed bacillary and amebic infection. In these cases there is the typical cellular exudate of bacillary dysentery, but motile trophozoites of E. histolytica are seen in the freshly passed specimen. Not infrequently, the heavy cellular exudate of the bacillary infection clouds the amebic side of the picture, and it is not until the acute phase of the bacillary dysentery has subsided that it is possible to find forms of amebae in the stools.

It should be noted at this point that a simple amebic infection may be complicated by bacterial invasion and the development of actual pus in the ulcerations. When this occurs, polymorphonuclear leucocytes are present in the mucus or stool specimen in addition to the amebae.

Treatment: The treatment of amebiasis is accomplished by a group of drugs which are quite specific in their antiamebicidal characters but different in the mode of action. The stage of the disease also determines largely which drugs will be used.

Emetine hydrochloride is indicated in acute amebic dysentery, and in the complications of amebiasis, such as amebic hepatitis, typhilitis, sigmoiditis, perforations of the bowel and amebic granuloma. In cases of long standing cyst passers it may be used in conjunction with the drugs my mouth. Emetine is a protoplasmic poison with special affinity to cardiac muscle. The drug should never be given by intravenous or intramuscular injection but only by subcutaneous injections. The dosage of choice is 1 grain (0.065 gram) and the blood pressure and pulse should be checked before each injection. Any drop in blood pressure or increase in pulse should be taken as an indication to discontinue emetine therapy temporarily or reduce the dosage. An electrocardiographic study of the heart is indicated.

Emetine enters the circulation and reaches the amebae deep in the tissues of the bowel and also those lodged within the liver.

Other drugs act upon the amebae on the surface of the mucosa and on the lumen of the bowel.

Treatment of Bacillary Dysentery: Two major points are to be considered in the treatment of bacillary dysentery: the treatment of the bacillary infection, and the handling of the coincident shock and toxemia. It is essential that the patient be considered as a whole, and both forms of therapy carried out simultaneously.

Sulfaguanidine and sulfadiazine therapy have altered very markedly the prognosis of bacillary dysentery. Both drugs are about equal in efficacy, the choice being determined by availability and the experience of the physician. From personal experience both in the Caribbean and in India, I favor sulfaguanidine. The action is prompt, the response of the patient is dramatic, and the subsequent healing of the bowel has been good as determined by sigmoidoscopic examination and microscopic study of the bowel discharges.

The effective dosage of sulfaguanidine or sulfadiazine is 3 grams immediately followed by 1 gram every three hours night and day for at least 24 hours and as long thereafter until the symptoms have abated. In case of nausea or vomiting the first dose of sulfadiazine, 2 to 3 grams may be given intravenously in a liter of saline. The dosage may then be reduced to 1 gram every four hours, the patient to receive at least five doses for the next 24 hours. If progress is satisfactory, the dosage can be further reduced to one gram every four hours, giving 4 grams in 24 hours. It is best to continue on this program for at

TABLE I.
TREATMENT OF AMEBIC DYSENTERY:
THE FOLLOWING TABLE GIVES THE DRUGS AND DOSAGES COMMONLY EMPLOYED IN THE TREATMENT OF AMEBIC DYSENTERY AND ITS COMPLICATIONS

Drug	Single Dose	No. of Doses Daily	Total Daily Dosage	Total Dosage of Single Course of Treatment	Indications
Emetine Hydrochloride*...	⅛ gr. (0.032 Gm.) Subcutaneously	2 (a.m. & p.m.)	1 gr. (0.065 Gm.)	7 gr. (0.455 Gm.)	Acute and chronic amebiasis, amebic granuloma, hepatitis typhilitis perforations.
Diodoquin Tablets of 3.2 gr. each.....	3-4 tablets	4 (t.i.d., p.c., & bedtime)	12 tablets (3.84 Gm.)	200 tablets (64.00 Gm.)	Acute and chronic amebiasis with trophozoites and cysts of E. histolytica.
Chiniofon Tablets of 0.25 Gm. each.....	2-3 tablets	3 (t.i.d., p.c.)	6-9 tablets (1.5-2.25 Gm.)	100 tablets (2.50 Gm.)	Chronic amebiasis, cyst passers.
Vioform Tablets of 0.25 Gm. each.....	3 tablets	3 (t.i.d., p.c.)	9 tablets (2.25 Gm.)	100 tablets (25.0 Gm.)	Acute and chronic amebiasis with cysts of E. histolytica.
Carbarsone Capsules of 0.25 Gm. each**.....	1 capsule	2 (a.m. & p.m.)	2 capsules (0.5 Gm.)	20 capsules (5.0 Gm.)	Chronic amebiasis, with cysts.

*Myocardial poison—give subcutaneously only. Never to be given by intravenous or intramuscular injection. Blood pressure and pulse should be checked before each injection. Patient should be kept at bed rest if possible.
**Carbarsone is an arsenical and should not be used in any cases suspected of liver damage, such as amebic hepatitis.

least 72 hours after the acute symptoms have subsided and then gradually taper off until the drug is discontinued.

Intravenous glucose solution of 5% strength in normal saline in the amount of 1000 cc. should be given immediately on admission to the hospital, and preferably repeated again in 6 to 10 hours depending on the patient's condition. A minimum daily intake of 2500 cc. to 3000 cc. of fluids must be given and retained by the patient. It is essential also to check carefully the output to be sure it is adequate. Fluid intake and output must be maintained to combat shock, toxemia and also to prevent the deposit of sulfadiazine crystals in the kidneys and ureters. When indicated a unit of plasma (250 cc.) should be administered.

Malaria

MALARIA may simulate almost any other disease and is one of the problems which the industrial physician will have to consider in the differential diagnosis of any patient coming in with fever especially if the patient has been in an area where malaria is endemic. There are recognized four types of malaria, namely: Vivax malaria, caused by Plasmodium vivax (formerly called tertian malaria), Falciparum malaria, caused by P. falciparum (formerly called subtertian, aestivo-autumnal or malignant tertian), Quartan malaria caused by P. malariae, and Ovale malaria caused by P. ovale.

Vivax malaria is the type which is usually associated with relapses and these may completely simulate the original attack or as time goes on there may be slight modifications of the symptomatology especially if there has been more or less self medication on the part of the patient.

It is not uncommon for a patient with chronic relapsing vivax malaria to have a peak of fever daily, twice daily, or every other day with or without frank chills and sweating. The prodromal symptoms of pain in the eyes, muscular or joint pains, or back aches and pain are frequently seen. Some individuals have periodic attacks of profuse drenching sweating, with only a moderate rise in fever and no definite chill.

In falciparum malaria it is not uncommon for patients to have a gradual rise in the fever curve and maintain a fastigium with only slight daily variations. These patients are the ones most likely to develop cerebral malaria or blackwater fever, to have abdominal crises and sudden enlargements of the spleen, and even a spontaneous rupture of the spleen or bowel hemorrhages.

Diagnosis: Any person developing fever of the tertian or quartan type, and those individuals with unexplained fever who have been in a malarial area should immediately be suspected of having malaria and careful search of the blood made for the plasmodia. The diagnosis of the type of malaria, as deduced by the laboratory is more than of academic interest, for it gives the indication for therapy.

The various methods of diagnosis of malaria are detailed in standard textbooks, but the most important practical points will be considered. The thick film method using Giemsa stain still is the best all-around method. This serves as a concentration method, and with a little practice it should be possible for the laboratory technician to diagnose not only the presence of malarial parasites, but species as well. The thick film will be positive in many cases when the thin film is negative. It is both time saving and easier for the technician. The use of Field's stain has been advocated, but while this is a more rapid method it does not seem to be as consistently reliable as is the Giemsa stain. Complement-fixation tests have been used, but these are not as valuable nor as practicable as routine procedures, and the same applies to flocculation tests.

One point in the diagnosis of malaria should be noted, and that is the use of adrenalin. Occasionally there are patients in whom it is impossible to demonstrate malarial parasites, but from all appearances they are suffering from the disease. The subcutaneous injection of 0.5 to 0.75 cc. of adrenalin will frequently make possible the demonstration of parasites in such patients. A thick blood film made 30 minutes after the injection reveals the parasites. The only precautions are those usually associated with the use of adrenalin.

Treatment: Atabrine and quinine are the drugs commonly employed in the treatment of malaria. Both have their ardent advocates. Atabrine is the drug of choice whenever available. The methods of administration are:

1. *Atabrine*
   Routine Course—0.2 gram by mouth every four hours for six doses followed by 0.1 gram t.i.d. for seven days.
   Emergency Treatment—In cerebral malaria, 0.2 gram to 0.6 gram intravenously in either one unit (250 cc.) plasma, 250 cc. whole blood, 500 cc. normal saline or saline and glucose. Distilled water may be used if none of the preferred diluents are available.
   Intramuscular Injection—0.2 gram in heavy falciparum infection, vomiting from infection with any malarial plasmodium, bowel hemorrhage, rupture of malarial spleen, to be repeated at four-hour intervals until acute symptoms subside and patient is able to take medication by mouth.
   Suppressive Treatment—Tablets containing 0.1 gram by mouth daily while in malarial area and for 90 days subsequently.
   Chronic Relapsing Malaria (Vivax)—Routine course as outlined above. If patient is vomiting or spleen is markedly enlarged, then give at least one intramuscular injection as noted above. Follow the routine course by 0.1 gram daily for 90 days.
2. *Quinine*
   Routine Treatment—0.64 gram (10 grains) of quinine sulfate orally three times daily for five days followed by 0.32 gram (5 grains) three times daily for seven days.
   Emergency Treatment—In cerebral malaria 0.64 gram (10 grains) of quinine dihydrochloride in 200 cc. sterile normal saline are injected intravenously very slowly. The same procedure is practiced in malarial patients with nausea and vomiting who are unable to retain medication or food.
   Caution—Quinine should not be injected intramuscularly because of sloughing which occurs.
3. *Plasmochin*—
   A tablet of 0.02 gram (1/3 grain) is given twice daily for five days, at the end of quinine therapy or after three to five days following completion of atabrine course. It is cautioned that plasmochin should not be given with or immediately following atabrine therapy. The physician should be on the lookout for such toxic symptoms as

methemoglobinemia and hemoglobinuria which may follow plasmochin therapy.

Complications: There are four major complications of malaria, and these are usually associated with falciparum malaria—blackwater fever, cerebral malaria, rupture of the spleen, and gastro-intestinal hemorrhage. The onset of any of these complications may be insidious or so dramatic that when a diagnosis of falciparum malaria is made, prompt energetic action is indicated. Any of these complications should be considered as a medical emergency.

Blackwater fever usually starts suddenly with high fever and hemoglobinuria—the port wine color of urine from which the name blackwater is derived. An abrupt dramatic loss of red blood cells occurs in a matter of hours; the count may drop from 4.5 million to 1 million. The patient goes into shock, and if prompt efficient therapy is not given he may die. After the onset of this condition, no malarial parasites are demonstrable in the blood. The precipitating factors are not all known, but seem to be related to the inadequate treatment of falciparum malaria with quinine. Treatment of blackwater fever includes:

1. Blood transfusions: 500 cc. may be given two or three times daily until hemoglobinuria disappears, and the red count improves. Great care must be exercised in typing, cross matching, and evaluation of the Rh factor.
2. Alkalinization: Intravenous infusion of sodium bicarbonate in saline is given by adding to 1000 cc. of normal saline 3.75 grams of sodium bicarbonate dissolved in 50 cc. of distilled water. As soon as the patient is able to retain substances by mouth, sodium bicarbonate should be given until the urine becomes alkaline. If the patient develops anuria, it may be necessary to repeat the intravenous infusion of sodium bicarbonate. Care should be taken note to throw the patient into a state of alkalosis.
3. Combat shock with heat and bedrest.
4. Atabrine may be resumed after cessation of fever and hemoglobinuria crisis.

The main points to remember in the treatment of blackwater fever are the blood transfusions and alkalinization. Frequent blood transfusions are required, and care should be exercised with respect to cross matching, grouping, and the Rh factor.

Cerebral malaria is a complication of falciparum malaria in which the parasites adhere to themselves and to the intimal lining of the capillaries of the brain causing at times complete blocking of the vessels. If the condition persists for any length of time, the damage to the brain substance may be inevitable. If the blockage is relieved early enough and the circulation of blood reestablished, complete recovery is the rule. However, after a certain period of time, even though energetic methods of therapy are employed and the parasites eradicated from the vessels, death may occur; in many of these cases at autopsy empty capillaries with a zone of necrosis around them were found.

Coma, semicomatose condition, stupor, or even slight mental changes in patients known to be infected with Plasmodium falciparum or in those having an unexplained fever who have come from a malarial area, should immediately arouse the suspicion that the patient may be suffering from cerebral malaria. It should be pointed out that in such cases the parasites may not be demonstrable in the blood. This is because the developmental forms of the falciparum malarial parasite occur in the internal organs and are not seen in the peripheral circulation. Thus even before it is possible to demonstrate the rings of falciparum malaria in either thin or thick films of blood, the conditions leading to cerebral malaria have occurred within the capillaries. As soon as cerebral malaria is suspected it is the duty of the physician to institute energetic specific antimalarial therapy.

An intravenous injection of atabrine should be given immediately in a dosage of at least 0.2 gram, or preferably 0.4 to 0.6 gram, if possible in a unit of plasma (250 cc.). If plasma is not available then normal saline or saline and glucose solution may be used, and if none of these is available then the atabrine should be diluted in distilled water and injected directly into the vein. If atabrine is not available then 15 grains of quinine may be dissolved in water or saline and given intravenously. Regardless of which drug is available, speed in administration of the drug is imperative, and the prescribed treatment should be given without delay, for only moments lie between life and death in the massive blockage of the cerebral capillaries with falciparum malarial parasites. In addition to atabrine or quinine, blood transfusions may be given. The patients do well in the sitting position in bed.

Spontaneous rupture of the spleen occurs in patients with chronic malarial infections. In many of these the spleen is barely palpable at the first examination, but during an acute exacerbation of the malaria there may be a sudden and dramatic enlargement of the organ. Anything which will cause an increase of intra-abdominal pressure may cause rutpure of the viscus. A paroxysm of coughing, straining to move the bowels, or what would ordinarily be insignificant pressure on the abdomen as falling or straining to lift an object, all have been known to result in rupture of the spleen.

Treatment of this condition is immediate removal of the ruptured viscus. Blood and plasma transfusions are indicated for treatment of the shock. Anti-malarial therapy should be started as soon as the patient is well enough to accept other medications. During the immediate post-operative period, the high fever demands at least a single intramuscular injection of 0.2 gram atabrine, and if the patient can tolerate medication by mouth the usual dosage of atabrine should be given.

Gastro-intestinal hemorrhage is the fourth complication of falciparum malaria which should be looked out for. Usually the hemorrhage is massive without the diarrheal symptom-complex. Treatment consists in the immediate intramuscular injection of 0.2 gram atabrine followed by the usual course by mouth.

Helminths

THERE are two main groups of helminths which are likely to concern industrial physicians—intestinal parasites and those which invade blood and tissues. The intestinal parasites include Ascaris lumbricoides, hookworm, pinworms, whipworms, and tapeworms. The blood and tissue worms fall into two broad classes —trematodes (flukes) and the filariae. Included in the group of flukes are the liver fluke (Clonorchis sinensis), lung fluke (Paragonimus westermanii), and the blood flukes of the bilharzia group (Schistosoma mansoni, S. japonicum, and S. hematobium). The filariae include Wuchereria bancrofti and W. malayi, Loa loa, Acantheilonema perstans, Mansonella ozzardi, and Onchocerca volvulus.

Symptomatology: Infections with the intestinal helminths may or may not directly cause clinical symptoms. Many of the bizarre symptoms recorded are

hard to correlate with the known habits of the worms. For example, hookworm disease with emaciation and anemia is a distinct entity. There are, however, symptoms which are more or less secondary, such as varying degrees of anemia, symptoms resulting from an ascaris or pinworm entering the appendix or biliary ducts, obstruction to the bowel when a large mass of ascarids from a bolus and lodge in some portion of the small intestine, perforations especially during typhoid fever when an ascarid enters an ulceration, passage of worms or segments of worms through the stomach and esophagus into the mouth, nose or larynx. In children, especially, ascarids are likely to be found in these locations, and when the worms enter the larynx the condition may become serious in a very short time. Frequently, worms or segments of teniae are passed through the rectum, and then inconvenience and discomfort from the presence of the worms on clothing are the main complaints.

It is impossible to generalize regarding the clinical picture produced by the tissue and blood worms, because the symptoms which they present are so diversified, and depend upon the location of the parasite. One of the main points to be considered in the history of the patient is the geographical area from which he comes. This information coupled with a knowledge of the prevailing parasites in the region will help to clinch the diagnosis.

Infection of the tissues with filariae may cause the disease condition known as filariasis. Both acute and chronic phases of filariasis, as well as a condition in which microfilariae are present in the blood stream with no clinical symptoms, have been recognized. It should be pointed out that patients with acute symptoms of filariasis may not have circulating microfilariae.

Acute filariasis infection with Wuchereria bancrofti may involve the genital organs, and produces superficial lymphangitis of the extremities with or without regional glandular involvement; multiple lesions including local areas of inflammation and even abscesses, angioneurotic edema, with lesions appearing as giant urticaria, in regional glands; swelling and edema of the extremities with pain, tenderness, fever; involvement of the deep lymphatics; and occasionally no symptoms except for the presence of microfilariae in the blood.

In the cases studied, most of the evidences of acute symptoms disappeared following transfer from the islands of the South Pacific to the United States. However, inasmuch as we are not sufficiently familiar with the future of these cases, a long range prognosis awaits the passage of several more years. It is known on the basis of previous experience with similar cases who have come to the United States from filaria-infected areas, that these persons may continue for many years in good health and then suddenly get exacerbation of the acute symptoms which lasts for a varying period of time and then recedes. A curious fact is that when these patients are placed in jobs requiring that they work in atmospheres of high temperature and humidity, such exacerbations are more likely to occur. Many such exacerbations occur over the years, but after they have subsided the patients are as well as ever. The development of chronic states such as elephantiasis of the extremities, testicles, or penis, as a general rule seems to take many years, although cases are known where the first symptoms were evidences of elephantiasis, but these are rare.

The diagnostic methods for demonstrating circulating microfilariae include:

1. Thick blood films using about 20 cm. of blood spread out as a drop to about the size of a dime on the slide and stained with hematoxylin.
2. Examine the sediment for microfiliariae obtained from centrifuging for five minutes 10 cc. of blood to which has been added an equal amount of 10% saponin solution.
3. Skin tests and precipitin tests are at present under investigation, with efforts directed toward the perfecting of an antigen of greater specificity than any of those which are at the present time available.

It should be pointed out that patients with acute symptoms of filariasis may not have circulating microfilariae.

Treatment: Intestinal parasitic infections are treated by drugs which paralyze or kill the worms which are then removed by adequate purgation. The following table summarizes the drugs which are value in the treatment of intestinal helminths.

It is cautioned that many of these drugs are toxic and that while the dosages recommended are effective they may at times cause symptoms of intoxication, especially liver damage. This is particularly true of carbon tetrachloride, tetrachlorethylene and oil of chenopodium. Magnesium sulfate is the purgative of choice because it does not put the drugs into solution nor aid in their absorption with resultant liver damage. It should be remembered that following the administration of any anthelmintic the evacuation of the bowels must be accomplished promptly within the specified time in order to remove the toxic substances. If nausea or vomiting occur, then enemas must be resorted to in order to start the bowel movements.

Treatment of the various flukes has progressed quite markedly in the past few years, although no specific has yet been found. The various forms of antimony have given the best results. The earlier preparations of antimony-potassium tartrate have been replaced by the much less toxic forms, such as

TABLE II.
DRUGS USED IN TREATMENT OF INTESTINAL HELMINTHS

Drug	Maximum Adult Dose	Child Dose** per Year of Age	Used for Treatment of
Hexyl resorcinol (Caprokol crystoids)	1.0 gm.	0.1 gm.	Ascaris, hookworm, whipworm, pinworm. Suggested also for tapeworm.
Tetrachlorethylene*	3.0 cc.	0.2 cc.	Hookworm, tapeworm.
Oleoresin aspidium	6.0 gm.	0.4 gm. (per 10 lbs. body wt.)	Tapeworm.
Gentian violet (4½ hour enteric coating)	0.19gm. (3 grains daily)	0.01 gm. (daily)	Pinworm, Strongyloides, Clonorchis sinensis.
Oil of chenopodium	1.0 cc.	0.2 cc. (from 4 yrs.)	Ascaris, hookworm, whipworm, pinworm.
Carbon tetrachloride	3.0 cc.	0.2 cc.	Hookworm, tapeworm.
Santonin: Single dose	0.2-0.3 gm.	0.01 gm. (⅙ grain)	Formerly used for all parasites.
Given as divided doses daily for 7 days	0.06 gm.	0.025 gm.	Do not give on empty stomach—do not use oil cathartic.

*Less toxic than carbon tetrachloride and equally efficient.
**Total child dose should never exceed adult dose.

uadin, and more recently athiomoline and urea stibamine have been found to be quite effective.

Filariasis is generally treated symptomatically. Drugs aimed at the destruction of the worms are only moderately successful, and to date there is no known specific. Antimony preparations used as outlined under the treatment of fluke infections, have given good results, but cures are questionable.

Preventive Medicine

—In Engineering Education—

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DESPITE the current popularity enjoyed by public health and sanitary engineering, both intra- and extra-murally, it appears to me that one important educational phase is being immeasurably neglected. This phase, and I prefer to call it "preventive medicine in engineering education," deals with the training of engineers other than those in sanitary and public health. It is roughly analagous to the comparison of preventive and curative medicine, wherein, for instance, the engineers practice the prevention of typhoid fever by the purification of water and milk. This phase of the education of the engineer should give him sufficient knowledge to recognize industrial and domestic health problems when he encounters them to know where to go for expert advice, and lastly, to know how to apply that advice.

A program such as this should make possible effective "stop-at-the-source" as well as "early diagnosis" of health hazards. In addition to the actual financial saving to industry itself in time, insurance, and labor relations, the service of the existing sanitary engineering facilities could be greatly expanded. Carrying the analogy further, the Sanitary Engineer would cure the hazards after they cause damage while the plant engineer, by early diagnosis or preconsultation, would prevent the hazard from arising; thus, "preventive medicine."

There are now existing glaring instances in the everyday life of the practicing sanitary engineer, where a minimum amount of training in public health responsibilities to other engineers would greatly assist him in his work. For example, consider the multitude of cases of "man-made malaria" caused by civil engineers through inadvertently-placed culverts and barrow pits or construct reservoirs, so constructed as to provide prolific breeding grounds for malaria mosquitoes. Some acquaintance with the fundamental sanitary engineering considerations involved in malaria control could completely eliminate the curative engineering necessitated. The multitude of "cross-connections" encountered should further this testimony.

Quite frequently, architects as well as civil engineers are called upon to design food processing facilities such as ice houses, kitchens, canneries, milk plants and the like. These installations are seldom adequate from a health engineering standpoint, therefore. The experience of the average public health worker is to find much of their time and energy employed in the correction of the resulting health hazards. This could be salvaged if they were called in on initial design. One of the more serious diseases confronting the nation today, particularly in the South, is typhus fever, and one of the most important preventive measures is that of "rat-proofing" buildings. If the architects were advised in advance of this necessity, all "rat-proofing" activities could be curtailed. Recently the American Public Health Association has made available a pamphlet entitled *Basic Principles of Healthful Housing* which is a further indication of the trend.

How many mechanical engineers who are responsible for exhaust systems in industrial plants have a working knowledge of the noxious substances which they are required to exhaust or their physiological effects on man? For example, many noxious gases from welding, contrary to common opinion, cannot be safely removed by general ventilation because of their very low toxic limits or their accumulative effects. Quite often, owing to the localization of the gases at the point of generation and usually in the face of the welder, the exhaustion of enormous quantities of air develops a false sense of security. But time and time again the industrial hygiene engineer is confronted by an elaborate general exhaust system handling large quantities of air when a simple "point" exhaust system would be the satisfactory answer.

The great majority of the noxious gas exposures come under the jurisdiction of the chemical engineer. In general, he is cognizant of the acute exposures usually encountered, and perhaps a certain amount of the dermatitis, but seldom the more insidious prolonged exposures. For instance, it was the author's experience to observe a degreasing operation using trichlorethylene as a solvent which the unprotected workers were required to work over day after day. Prolonged exposures to trichlorethylene running literally into years result in serious physical damage and possible death, and with very little hope of repair. The engineers in charge of like processes could not be expected to be specifically informed, but had they had some advanced information so that they would have been alert to such hazards and called in the services of the State consultant or Federal Public Health Agencies, and more important still, had the willingness and ability to cooperate, such situations could be completely eliminated.

It is the author's belief that in most every phase of engineering there is some marginal infringement on health (see Table). Further, it is his belief that this health infringement is the responsibility of the engineer involved and that by giving him sufficient necessary knowledge to recognize the hazard, to know where to go for help, and to know how to receive and apply expert advice, he can shoulder this responsibility.

It is only fair to bear in mind that any work or process that can in any way affect the worker, affects consequently the health and welfare of the entire community. Thus the burden of cost of such training can and should logically fall on the people as a whole. Though not advisable, making it mandatory would be reasonable.

Also as previously noted, considerable saving in time and energy of the Sanitary Engineer can be a result of such training. First, other engineers will become receptive to services of the sanitary engineer. They will have established a common nomenclature, while now much valuable time is lost to sanitary engineers in explaining the basic problems. Second, the Sanitary Engineer will no longer spend his time searching out problems. Third, the burden of minor problems will be estimated. Fourth, time required in follow-ups will be greatly reduced. Fifth, the sanitary engineer will have more time to extend his services to new and urgently needed fields of investigation and

all of this will logically result in a saving to the community at large in increased production, and better living.

Realizing the engineering curricula are grossly overcrowded, it is still the considered opinion of the author that every engineer should become actually acquainted with the average problems confronted by the practicing sanitary engineer, created by other engineers like myself. All engineers should have a speaking knowledge of food and premise sanitation; water supply, sewage, and waste disposal; and industrial hygiene. It is suggested that this material might be in the form of descriptive course work in the senior year with a supplement of film strips and movies which, it is the author's understanding, will be made available shortly through the agency of the U. S. Public Health Service.

Rather than a complete course devoted to these plans, perhaps the selective insertion of pertinent material by means of a lecture or two in an established senior course would work best. Thus, the chemical engineers, for example, might get two or three lectures on health consideration applied to chemical engineering in a senior seminar. Further, it might be possible to so schedule this material that a student could follow the course and lecturer from department to department and get all the material as well as course credit. The lecture should, of course, be developed by the Sanitary Engineering Department.

Every engineer has a responsibility for the processes that he creates, the purpose of this training would be to develop this responsibility and at the same time effect considerable saving in time, energy, and lives of all concerned, engineers, workers, and management.

INDICATING PHASES OF ENGINEERING AND INFRINGEMENT ON HEALTH

Civil Eng.	Chem. Eng.	Mech. Eng.	Arch. Eng.	Elec. Eng.
Malaria	Wastes	Abnormal Heat or Pressure	Typhus	Housing
Water	Noxious gases	Heating and Ventilation	Kitchens	Illumination
Sewage	Food Processing		Housing	Noise
Wastes	Mining	Air conditioning	Air conditioning	
Mining—Gases Pressure	Water Treatment			
Ship Building	Tunneling			

Medicolegal, as to Lead

BOTH medically and legally it has been hard to determine when a case of lead absorption becomes a case of lead poisoning. That a person can absorb lead in limited quantities without toxic effects is undisputed. If the three criteria for diagnosis of lead poisoning are considered to be the clinical history, the physical examination, and the laboratory data, cases can be found in which only one is positive and the others negative, or two are positive and one negative, and in some cases all three may be positive, and yet the worker himself has made no specific complaint nor has he sought medical aid. It is little wonder then that there is difficulty in adjusting and settling compensation cases. Three major lines of reasoning have been offered to establish the diagnosis legally. These are: (A) That the worker is being poisoned at any time that absorption becomes evident by any criteria for diagnosis. (B) That it can be assumed that the worker has absorbed enough lead to poison him when he first loses his sense of well being and seeks aid from his family physician for symptoms which can be proved to be due to lead absorption. (C) That the worker has only contracted lead poisoning when his symptoms become so severe as to prevent him from working. What the final decision by the courts on this problem will be can only be decided by time. It does seem logical that the second premise in which the worker is considered to have poisoning when he first seeks relief from the symptoms of poisoning, (and the symptoms are definitely due to the poisoning) should be the most acceptable. This reasoning has been adopted by some courts.

—From "Lead," (Vol. 1, No. 1) *Industrial Health Bulletin*, State of New Jersey Department of Health, Division of Industrial Hygiene.

Laceration of the Liver

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DEATH by exsanguination, from a traumatized liver, has not been sufficiently stressed because adequate objective testimony is not available to make a diagnosis. Many patients die without the objective evidence of operation or postmortem examination.

Exsanguination can be produced from an apparently minimal lesion and terminate fatally in a short period of time. Shock from hemo-peritoneum produces a violent reaction. The cases under discussion are those which have come to the authors' attention by their own experience and from a review of the available literature. The subject of liver laceration by blunt force has long been controversial. Many cases, clinically diagnosed as liver laceration, have not been reported because sufficient evidence is lacking to prove the diagnosis. All cases herein discussed were verified by laparotomy or postmortem findings.

A review of the literature presented brings to light the development of thought relative to this problem. The authors feel that a recapitulation of the subject is warranted in view of newer developments in diagnosis and treatment. A tabulation of cases is presented in Table I. Two cases treated by the authors will be described, both having been operated with survival.

TABLE I.

1905—Tilton (10 year series 1895–1905)	12 cases	62.5%	Mortality
1926—Moynihan (recording Terrier and Auvray's cases)	11 "	48%	"
1927—Furtwaengler (one case)	1 "	100%	"
1928—Vance	21 "	100%	"
1930—McKnight (recovered)	1 "	0%	"
1931—Wulsten	1 "	100%	"
1932—Henschen	1 "	100%	"
1933—Shann & Fradkin (two recovered)	3 "	33⅓%	"
1934—Orr & Helwig (reporting Rosenbaum's case)	1 "	100%	"
1935 & 1939—Helwig and Orr	6 "	50%	"
1936—Kreig	8 "	87.5%	"
1938—Branch (all recovered)	2 "	0%	"
1939—Lamb (41 died, 19 survived)	60 "	68.5%	"
1941—Boyce	8 "	87.5%	"
1941—Sullivan	1 "	100%	"
1941—Clarke	1 "	0%	"
1941—Hawthorne, Oaks, Neese	1 "	0%	"
1941—O'Neill	100 "	82%	"
1942—Pilcher, L.S.	1 "	0%	"
1943—Rademaker (spontaneous ruptures—five lived)	29 "	82.7%	"
1946—Present authors (two cases, both survived)	2 "	0%	"
	271 cases	57.22%	Mortality

One can hardly improve on the classification of ruptures of the liver offered in 1926 by Moynihan.[1] He places them in three categories:

1. Rupture through Glisson's capsule.
2. Subcapsular hemorrhage and separation of the capsule.
3. Central rupture with hematoma and abscess formation. The mechanics of liver rupture have long been a source of contention. Most surgeons are

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familiar with the most common type of direct trauma over the right lower ribs and flank, and cases have been reported resulting from direct trauma over the upper anterior abdomen and lower chest. The authors observed one case of this type with the actual production of a large sequestrum of liver substance lying almost free in the abdomen.

The sudden tremendous force which, at times, develops within the abdomen from increased intra-abdominal pressure in the uterine and abdominal contractions of labor, has been recorded by Rademaker[2] in a series of 29 cases of spontaneous liver rupture. Least common of all is trauma by contra-coup. It is difficult to classify those pathological livers ruptured by blunt trauma. Rademaker's series, for the most part, consisted of that type, except for those ruptured during normal labor. However, superimposed upon the abnormal pathology is the condition of increased intra-abdominal pressure.

The Diagnosis of Laceration of the Liver

THE diagnosis of liver injury by blunt trauma to the abdomen is very difficult. One has to differentiate this entity from that of ruptured viscus, ruptured spleen, kidney, and ordinary local abdominal wall hematomas with peritonitis. "The opening of the abdominal cavity is indicated, not only in every certain case of liver injury, but also when such an injury is merely probable." This quotation from Kirschner,[3] famed European surgeon, is more applicable today than ever before.

Both Hinton,[4] in 1929, and Willis,[5] in 1934, expounded the conservative attitude toward liver trauma. Boyce,[6] in 1941, again reiterated the principle mentioned by Kirschner in Ravdin's translation, questioning the wisdom of such ultra-conservatism. The authors agree with Boyce—the patient is offered a greater chance for survival by proper and judicious surgery based upon laboratory and clinical findings.

The use of the hematocrit, with its plasma and whole blood specific gravity determinations, is of a great aid. One to two hour readings are done and a constantly falling hematocrit indicates continuing hemorrhage that must be arrested.

The differential diagnosis must include ruptured hollow organs such as ulcer, small and large intestines, lacerated kidney, rupture of the musculature of the anterior abdominal wall as the rectus muscle rupture. Torsion of the omentum, volvulus and intussusception must be included as well as mesenteric thrombosis.

Among the diagnostic procedures, peritoneal tap may be attempted as well as peritoneoscopy. However, no single diagnostic procedure is, in itself, diagnostic. The entire diagnostic armamentarium of the surgeon must be utilized at times to make certain of the diagnosis.

The hematocrit is simplicity itself and can be used with just a few preliminary instructions. A series of six-ounce bottles containing solutions of copper sulfate of known specific gravity is all that is required. The simplest arrangement, which is sufficient for any emergency requirements, is a series of 15 such bottles. These may vary in specific gravity from 1.016 to 1.072. A few centrifuge tubes are used containing 0.05 cc. of heparin or liquaemin into which is placed 3 5 cc. of venous blood from the patient. One drop of this solution is put into the bottle of known specific gravity for normal blood, i.e., 1.052 as a mean average, and whether the drop rises or sinks will decide if the specific gravity is the same, greater, or less. To find the exact specific gravity, one merely has to find the bottle of copper sulfate solution that the drop of blood will not sink or rise in. This gives one the specific gravity of the blood. To obtain that for the plasma, one centrifuges the blood, takes off the plasma and drops this into the bottles of lower range specific gravity between 1.016 and 1.030. A low specific gravity of blood and plasma usually indicates hemorrhage. At times, a hemoconcentration may be deceiving. By using a line chart, one can determine the hematocrit reading and decide whether a true blood loss or a relative blood loss is present.

Outstanding among the physical findings is the board-like rigidity and splinting of the right side of the abdomen. This so closely simulates the splinting of a ruptured duodenal or gastric ulcer that it is difficult to differentiate. A flat plate of the abdomen may not be of any help since, frequently even in ruptured ulcer, no air is seen under the diaphragm.

One feature, however, appears of some significance to the authors. On x-ray film examination, there appears to be an elongated shadow as though the liver edge were prolonged downward, as one might detect in a cirrhotic liver. On laparotomy, this was found to be caused by blood collected behind the ascending colon. The cecum was attached along its lateral margin to the parietal peritoneum.

Peritoneal tap, anterior to the cecum, failed to show evidence of free blood in the peritoneal cavity. The tap, to be of significance, must be performed in such a manner that the needle enters the peritoneal cavity behind the cecum, between the liver and the posterior wall of the ascending colon. This is the site where the blood will collect.

The hematocrit is a remarkably accurate instrument and, when carefully used at frequent intervals, will indicate the loss of blood despite the fact that supportive transfusion may be taking place. Since the expected effect of transfusion does not materialize, the falling hematocrit will produce a step-ladder effect by rising after each blood transfusion and then later dropping as the blood pours through the torn liver. This step-ladder effect is, without doubt, a very important symptom of hemorrhage from a bleeding surface in suspected liver laceration. At present, the copper sulfate method of hematocrit determination is being used in our laboratories.

The prothrombin time is usually elevated, and the systolic blood pressure is low. The lowered systolic blood pressure, however, is not a sign of liver pathology alone, but is due also to shock from trauma and blood loss. A leucocytosis is usually present, which may be due to the relative factor of loss of red blood cells from the circulation. The small number of immature leucocytes present in the differential white blood count appears to be indicative of this inter-relationship, in contradistinction to the high immature count present in peritonitis from bacterial organisms. The low red cell count, together with the dropping specific gravity and hematocrit, are significant indications of hemorrhage. The first patient described by the authors was thus observed for 22 hours before laparotomy was decided upon, while the second patient was observed for a period of 10 hours previous to surgery.

Among the earliest reported traumatic liver ruptures are the two cases of spontaneous rupture cited by Andral[13] in 1829. These are reported in Rademaker's series of 29 spontaneous ruptures of the liver. In this series, gathered from the literature over a period from 1829 to 1943, two cases occurred during pregnancy and labor. Andral's cases were tumors of the liver, probably gummas or carcinoma.

Edler's[1] statistics, published in 1887, show a mortality of 78.1% in subcutaneous wounds of the liver. Moynihan[1] mentions the series of Terrier and Auvray, who operated on 11 cases of liver rupture, five of whom died.

In 1905, Benjamin Tilton[1] collected all the cases of liver trauma in the hospitals of the City of New York over a 10 year period from 1895 to 1905. Of these, 12 were due to ruptures by blunt force. The mortality of those operated on in this series was 62.5%.

Vance's[8] series, in 1928, of 21 cases present a very interesting group of figures. In 33.3% of this series, there was an immediate mortality. Another 38% terminated fatally in the first six hours. He found that only 28.6% of patients lived long enough for clinical observation and, of these, only 10% were ever in condition for surgery. Accordingly, 90% of all such cases in his series died before the surgeon could attempt to save them. His series of 21 cases was taken from the records of the Medical Examiner's Office of the City of New York as follows:

Seven died at the scene of accident.

Eight lived one to six hours.

Two lived one to 24 hours and died of intra-abdominal hemorrhage. One of these died after laparotomy, during which the laceration was packed with gauze, but this failed to stop the bleeding.

Two lived four to five days. One died from hemorrhage and bile peritonitis, the other from pneumonia and alcoholism. The dome of the liver in the latter case had several small lacerations, with slight bleeding, "apparently not sufficient to cause death."

Two lived 11 to 15 days. One died from bile peritonitis, and the other from hemorrhage, although he had been packed with gauze at the time of operation.

Present day methods can accurately aid in determining the condition of the patient; so much so that 14 of these 21 who lived from one hour to 15 days after injury might have been aided to a greater extent. In addition, almost 20 years of progress has been made with the advantage on the side of our own contemporaries.

McKnight,[9] in 1930, reported a case with recovery. This patient ran a blood urea of 268 mgm. per 100 cc. of blood, with other findings consistent with kidney damage.

In 1931, Wulsten's[10] case, on postmortem, revealed an intact liver capsule with a large cavity in the right hepatic lobe, containing a dirty brown fluid. Microscopic examination showed no evidence of infection, so it was assumed to be traumatic. Henschen,[11] in 1932, also described kidney changes on postmortem.

Shann and Fradkin[12] reported three cases of liver rupture in 1933, with recovery of two.

In 1932, Orr and Helwig[13] began their series of reported cases of liver damage from trauma. This was followed in 1934, 1935 and 1939[14] by further reports. In 1934, Orr and Helwig reported Rosenbaum's case, which terminated fatally and, in 1935 and 1939, also reported six additional cases, three of whom died. Rosenbaum's case died of anuria 30 hours after injury.

Kreig, in 1936,[15] offered a discussion of a series of 60 cases of hepatic trauma. There was an etiology of blunt force in eight of these, of which seven died with a resulting mortality of 87.5%.

Branch,[16] in 1938, recorded two cases, both of whom recovered.

In 1939, Lamb[17] presented his series of 60 cases, with only 19 survivals. Some 26 died before operation could be performed while 34 were operated on with 15 deaths. Twenty-five died in six hours or less, and 12 died after 12 hours of hospitalization, giving him an over-all mortality of 68.5%. Lamb's observation that, "rupture of the liver, despite all known authoritative opinions as to its frequency, is still one of the rarest reported surgical emergencies," is certainly true. Most men have a tendency to avoid making this diagnosis, feeling that very little could be done because of the difficulties in producing hemostasis. One should be reassured on this point. Not only do sutures hold in the proper place, but blood vessels of the liver substance can be clamped and ligated. The liver substance itself, of course, is highly friable. A method of dealing with this type of bleeding will be considered under treatment. Thole believed that the mortality in lacerations of the liver increased 2 to 5% with each hours' delay in the institution of treatment. Early diagnosis and early operative intervention are imperative.

In 1941, Boyce[6] collected a series of 98 cases of liver wounds, of which eight were produced by blunt force. Seven of these died, with a resultant mortality of 87.5%. Boyce, in his remarkable monograph, failed to see the practicability of the suggestions of Orr and Helwig, made in 1939, that blood and urine studies would aid in making an early diagnosis of liver rupture. He was correct, however, in disagreeing with the type of blood test which they considered diagnostic. In the light of our present knowledge of the use of the hematocrit, giving blood and plasma protein determinations, the laboratory is an invaluable aid in evaluating the condition of the patient. These tests help indicate the prime necessity of early surgical intervention. The physical findings and their proper interpretation by the experienced surgeon, together with the laboratory aids, make an ideal combination toward diagnosis and treatment.

In 1941, Sullivan[18] reported a single case with mortality, while Clarke[19] reported one with recovery. In addition, Hawthorne, Oaks and Neese[20] reported a case with recovery. O'Neill,[21] in the same year, presented his series of 100 cases collected over a 10 year period at the Los Angeles County Hospital. Thirty-two were operated upon, with a mortality of 40%. The other 68 cases did not undergo surgery, but the diagnosis was confirmed by autopsy. The entire series, therefore, had a mortality of 82%. One gathers the impression that early surgery offers the greatest chance for survival.

The case of Hawthorne, Oaks and Neese[20] is worthy of mention in that the findings at operation were unusual. They found a blood clot in the gall-bladder. The organ and the liver were intact. The gall-bladder was removed, but the patient bled into the duodeum from the hepatic ducts, although no external evidence presented itself grossly. In all probability, there was an internal hepatic injury.

In 1942, Pilcher[22] reported his case with recovery. In addition, the patient also sustained a laceration of the right kidney, which was so severe that the kidney had to be removed at the time of operation. The liver laceration was closed with interrupted sutures of chromic catgut. This patient was operated on one and a half hours after injury.

The over-all mortality of 57.22% is significantly high enough to warrant careful study and appraisal of the possibility of saving life in rupture of the liver by blunt force. Of the 271 reported cases in American literature, such a high mortality is evidence enough of the seriousness of an entity that has been by-passed by many surgeons. There have undoubtedly been many more cases than those reported. However, owing to

the fact that no operation was performed nor necropsy findings reported in this group, more exact information is not available. Many have died with the diagnosis unconfirmed by postmortem or operation. With the advent of newer methods of transfusion, plasma and protein hydrolysate and amino acid administration, and other methods of blood and fluid replacement as well as newer methods of anesthesia and modern conceptions of the body physiology, the surgeon has been greatly aided in his effort to save life.

The old feeling that the patient is going to die anyway must give way to the modern trend that death may, at times, be avoided by fortifying the patient and tying up his wounds. Investigators have shown that debridement of the liver is not as fatal as failure to do something about it. While, in all probability, it is true that some minor lacerations of the liver have survived with expectant treatment and watchful care, this cannot be commended today because watching and waiting over a long period may only be an invitation to attend the demise of a patient.

Treatment of Lacerations of the Liver

BRUNS,[23] in 1870, successfully repaired a lacerated liver with survival of the patient. By the year 1883, Linz[23] became bold enough to attempt the removal of a liver tumor. He resected one such case, but the patient made an exitus. Until the beginning of the twentieth century, various methods were attempted with uniformly poor results. The occasional success was regarded as a miracle. In 1902, Carl Beck[23] described the use of muscle packing to stop liver hemorrhage and cited his case in which it was used successfully. A valuable point to keep in mind is that one can control liver hemorrhage manually by digital pressure on the portal vein at the foramen of Winslow. With bleeding under temporary control, one can then pause to take stock of the situation and decide on the method of choice in each given case. Clemente advised the use of compression clamps, Ulman[23] cautery, while Beck used gauze packing as well as omentum and rectus muscle transplants. Snegirew[23] advised the use of steam to produce coagulation. Ceccherelli and Bianchi[23] suggested the use of decalcified bone plates fastened to the liver as a vise to produce compression and apposition of the bleeding surfaces. Mikulicz and Schmidt[23] favored curetting and tamponade. Ligature en masse was favored by Lucke and Isreal[23]. Beck[23] himself preferred the use of "broad and long flaps of fascia and peritoneum" in cases where a large portion of the liver is being removed. He also favored the transverse incision in approaching the liver surgically.

In 1943, Sano and Holland[24] described the coagulum contact technique in traumatic rupture in dog and man. This was based on previous studies made by Sano on the use of a coagulum in skin grafting.[25] This method is deserving of further study and trial because it has a physiological basis of great merit.

Today, in addition to the proper readjustments of fluid balance, nitrogen balance and hemoglobin level, one must think along the lines of physiological repair of torn and shattered tissues; physical repair alone is not sufficient. The constitutional factors must be given consideration and active support where needed. The treatment rendered in the process of tissue healing and repair must be regarded with scientific knowledge as a background.

The first case reported by the authors was treated without the use of sutures. A product known as Gelfoam, (a gelatine substance) was packed into the liver laceration. A strip of rectus muscle was laid on top of this and wedged in. The abdomen was closed without drainage and the patient made a good recovery, leaving the hospital in 13 days.

The second case was operated upon and a sequestrum of liver substance removed. It was 1 x 2 x 1 inches in size. In addition, a macerated mass of liver tissue was removed from the abdominal cavity and a large piece of rectus muscle was sutured across the raw liver substance. The patient made an uneventful recovery and returned to full naval duty in two and a half weeks.

CASE 1: A 42 year old female, a native of Puerto Rico, was injured while riding in a taxicab as a passenger. In a head-on accident with another cab, she was thrown against the wall of the vehicle during the collision. She suffered multiple contusions and abrasions of the head, face, arms and shoulders. The right chest and the right side of the abdomen, although very painful, showed no external evidence of injury. Her chief complaint when seen in the emergency room was severe pain in the right upper quadrant of the abdomen and lower half of the right chest. The patient showed clinical evidence of shock—pallor, cold skin, and profuse perspiration. The blood pressure was 100/56, pulse 80, temperature 99 and respirations 22. Dullness of percussion was found over the liver and also three fingers below the costal margin.

The abdomen was flat, not distended, with generalized abdominal rigidity and spasm, most marked over the right upper quadrant. Some tenderness was present over the right flank, lower right ribs, and right kidney posteriorly. A catheterized specimen of the urine showed no gross or miscroscopic blood. On admission, she had a hematocrit of 35 with plasma proteins of 5.42, a prothrombin time of 30.8 seconds (normal in this laboratory—21.3), plasma specific gravity of 1.022 and whole blood specific gravity of 1.046. Although the patient was given fluids, plasma and whole blood, the hematocrit continued to drop, first to 34, then to 33 and suddenly to 30. Attempt at peritoneal tap failed to reveal any free blood in the peritoneal cavity. A three-inch spinal needle was used. The site of election for the tap was two inches medial to the left anterior superior iliac spine. The systolic blood pressure dropped to 90 and the patient began to go into shock again. Operation was decided upon because all supportive measures attempted over a period of 22 hours had not resulted in improvement. Intravenous saline and glucose, plasma and whole blood failed to maintain the blood pressure or hematocrit determination of the specific gravity.

At operation, the abdomen contained about 500 cc. of blood in the right cecal gutter, behind the ascending colon. The liver was not enlarged as we had previously been led to believe from the x-ray flat plate. However, a pool of blood was trapped between the posterior portion of the ascending colon and the liver. Anterior to the cecum and anterior abdominal wall there was no evidence of blood. The cecum was attached in its entire length to the lateral peritoneal wall up to the hepatic flexure.

The procedure adopted was as follows: Through a right upper rectus incision, the laceration of the liver was demonstrated on the lateral side of the superior surface of the right lobe, under the 10th and 11th ribs. The laceration could hardly be seen but was easily felt by the examining finger. It was one and a half inches long and equally as deep.

It was found that, because of our incision, the laceration could not be too easily approached, sutures

could not be used and vessels, if present, could not be clamped. The patient's general condition was so poor that further extension of the incision more readily to approach the laceration could not be attempted for fear of prolonging the operation. It was decided, therefore, to pack the laceration with Gel-foam gauze, six strips being used, and then a strip of rectus muscle was placed over this. The abdomen was closed in layers. No drainage was used. The patient made a good recovery and left the hospital 13 days postoperatively. On discharge, the patient's prothrombin time had returned to 22.6, the hematocrit to 38, total proteins to 7.8 and the specific gravity of plasma proteins to 1.025. The blood pressure was 110/70.

CASE 2: An adult male, 26 years of age, a native of the United States, and a member of the Naval Reserve, while at work in a saw-mill, was struck across the upper abdomen and lower chest with a stud band which broke while he was using a band saw. The blow knocked the breath out of him and, although he could not move voluntarily thereafter, he did not lose consciousness. He entered the Naval Hospital at 9 A.M., and for a period of 10 hours was treated for shock and observed for internal injuries. Physical examination revealed a white adult male in primary shock. There was a welt across the lower right anterior chest at the ninth rib in the anterior axillary line and also at the ziphoid process in the midline. The abdominal muscles were rigid throughout, but the remainder of the examination was negative. The blood count and hemoglobin were within normal range; the white count was 10,500 and there was no shift in the differential. The urine presented no abnormal findings. The hematocrit was 45%; blood pressure 110/90; pulse 80-90; respirations 20. The patient was in moderate pain and received some sedation in addition to 750 cc. of plasma and saline intravenously. The patient began to complain of severe thirst and, after 10 hours, it was felt that laparotomy was indicated because of the physical findings and probability of a ruptured organ.

The abdomen was entered through an upper midline incision. The entire inferior anterior margin of the liver had been shattered. A large piece of liver substance, 2.5 x 5 x 2.5 cms., had been broken off and a large amount of macerated liver tissue was removed from the peritoneal cavity. The gall-bladder was lying free, being attached only by the cystic duct and artery. The spleen, stomach and intestines showed no abnormality. Hemostasis was maintained by sutures of chromic catgut. A large muscle graft was taken from the right rectus and sutured over the raw, bleeding surface of the liver. The gallbladder was then removed. Gauze packing and two Penrose drains were left in place and the abdomen closed.

Postoperatively, the patient was placed in an oxygen tent and transfused with whole blood, plasma and saline with 5% glucose. This was given in sufficient amounts for three days. The packing and drains were removed gradually, and the wound healed by primary intention. No biliary fistula developed; no excessive drainage occurred. Early ambulation was not permitted and the patient was kept in bed until the fifteenth day. He returned to full duty two weeks later.

Comment

MANY new methods have been developed in the past 10 years toward the more accurate determination of the pre-operative and postoperative requirements of patients, and the universal use of these will eventuate in better care of the patient and permit the surgeon to operate in the face of the gravest traumatic casualties. The advances of anesthesia are a marked boon to the surgeon today, as well as the advent of massive transfusions of whole blood and plasma. The additional supportive use of amino acids, both as protein hydrolysate and as specific amino acids such as choline and methionine, as well as a great many others, have not been made too readily available for use in surgery, although they are now beginning to be used more widely. It is hoped that further study will be made, especially where more material is available, so that more extensive statistical information can be developed.

The use of muscle grafts, peritoneal grafts and thromboplastic materials has only been tried by a few surgeons. The possibilities presented by their use are so great and it is hoped that additional usage will be encouraged by this report.

While it is true that most surgeons do not think in terms of surgery for lacerations of the liver, it is well to keep it in mind and be prepared to act in this grave emergency.

The mortality in this condition has varied in individual cases from zero to 100%. The over-all mortality of the reported cases tabulated since 1829 averages 57.22%. This is much too high, and modern surgery should be able to give the victim of ruptured liver a greater chance for survival.

The attitude of defeatism should be discouraged in regard to this type of trauma. When once accomplished, this will lower the mortality to a considerable degree. Although the authors have tabulated 271 cases, there are, in all probability, many more in foreign countries, whose literature has not been available for the past few years because of the recent conflict.

Summary

A DISCUSSION of the advances of liver surgery has been offered.

2. A tabulation of 271 cases in the literature, mostly by American authors, has been made of liver lacerations and ruptures by blunt force.

3. Two cases are reported by the authors from personal experience.

4. Newer methods of liver hemostasis are presented, with the hope that more material and further work will be stimulated properly to evaluate these methods over a longer period of time as well as with a larger series of cases.

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Low Back Pain: A Different Cause and Treatment

—The Pronation Syndrome—

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THERE is a great diversity of opinion as regards almost every aspect concerned with acute and chronic low back pain. In spite of this variance, the subject of this paper advances a different approach.

A considerable mass of clinical material, most of it representing experiences of the past four years, will be presented to indicate that a variety of other symptoms in addition to those of low back pain can be caused by an exceedingly common type of faulty foot posture; namely, pronation or internal rotation of the feet.

Since all of these symptoms may have one cause, this complex has been termed the Pronation Syndrome. Evidence of various kinds will be presented to indicate that this primary pronation or internal rotation of the feet produces secondary anatomical postural changes in the structures above, which, in turn produce multiple deviations in various weight-bearing lines. Some of these are demonstrable clinically by observation. Others, such as changes in the pelvic and spinal alinement can not only be demonstrated in serial radiographs, but the differences are also sufficient to be capable of actual measurement. From the diagnostic standpoint the presence of the syndrome should be suspected when confronted by one or all of four cardinal symptoms. These are: generalized fatigue, dull leg aches of various distributions, low back pain of various patterns, and sciatic neuritis or sciatica.

Interest will probably be enhanced by describing a series of completely unexpected events in their chronological order. In the beginning they were thought to be completely unrelated. Lately they have been found to be integral parts of one problem.

Investigation started as a result of complete dissatisfaction with methods of postural foot correction. An extensive follow-up made on patients originally complaining of painful feet revealed that the great majority were completely unrelieved when treated by removable arches of various types. As a direct result of this study, an office laboratory was set up to devise better methods. By evolution, this has been accomplished with reasonable satisfaction. More detailed information describing this different method of treatment will be given later.

As presently practiced, proper postural foot correction divides itself into two parts, each equally important. The first is the selection of a properly fitted rigid-shanked shoe; the second is the individual correction of these particular shoes.

This study, primarily designed to correct foot pain ended in making us extremely foot conscious. As a result, faulty foot posture was corrected wherever found even though the feet themselves were not painful. These patients had such symptoms as fatigue, dull leg aches, low back pain or sciatica, singly or in combination. When many of these patients obtained complete relief from their symptoms following postural foot correction, it was a source of considerable surprise. When improvements in technique made recoveries more frequent and consistent, the present investigation was started. At first it was simply a case of cause and effect resulting from an empirical application of treatment. It was only lately that we have been able to explain satisfactorily the mechanism by which faulty foot posture can cause low back pain.

Since pronation or internal rotation has come to assume a completely unexpected importance, it might be well to describe just what is meant by the term. The following simple experiment should eliminate confusion as to terminology. In the standing position, place both feet together with the inner borders parallel, keeping the heels touching, begin to separate the forefeet gradually. The first position is adduction; the second is abduction. Now separate the feet slightly and roll them inward at the ankle until all of the weight falls on the inner border. This is pronation, internal rotation, or inversion of the feet. Note that internal rotation of the foot causes internal rotation of the leg and that the degree can be estimated by patellar movement. Now, starting in the adducted position, abduct the feet as in the first experiment and at various points in the arc alternately pronate and evert the feet. This is to indicate that the movements of abduction or adduction are quite different from pronation or eversion. During this series of movements, one will find that in the extreme abducted position only slight degrees of pronation are anatomically possible. This point is of clinical interest and might help to explain why slight degrees of pronation in abduction are frequently the cause of symptoms, whereas, in adduction, not infrequently high degrees of pronation can be tolerated without symptoms. It should be distinctly understood that the term "flat feet" or lowering of long arches has nothing to do with the subject except that it occurs as a frequent accompaniment of severe pronation. In line with the foregoing is the observation that with high long arches even small degrees of pronation have been found productive of major symptoms. From the standpoint of incidence, pronation *per se* has been found to be present in some degree in the vast majority of all people. In a large number it is completely asymptomatic. This is particularly true of younger individuals. On the other hand it would seem to be the cause of symptoms in large numbers, these usually starting in early middle age. Delay in general recognition of the role of internal foot rotation is thought to be due to the fact that in a great number of these individuals the feet themselves are not painful.

The clinical recognition of pronation and its correction can be estimated by three different methods. These are: clinical inspection, a patellar test, and a radiographic estimation of pelvic shift.

Before presenting these diagnostic points, attention is called to the fact that the ideal, if not the normal,

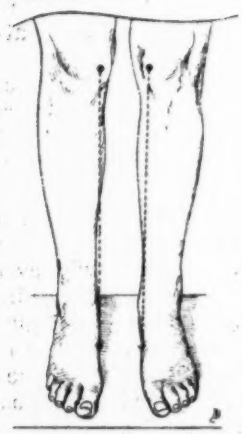

Fig. 1a.

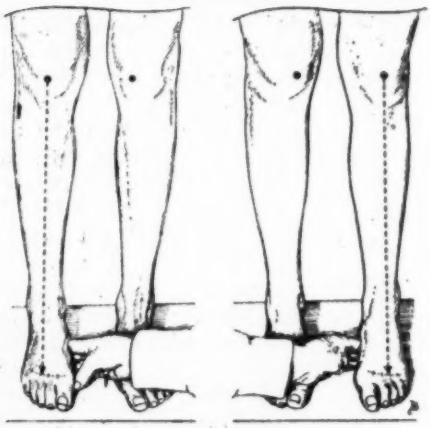

Fig. 1b.

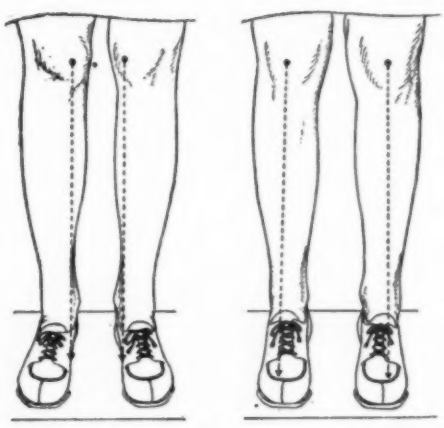

Fig. 1c.

THE PATELLAR TEST

(1a): Illustrating internal rotation of the patella indicated by central inked dot. Perpendicular dropped from this point falls to a point inside the dividing line—the shaft of the third metatarsal. (1b): Illustrating eversion of long arch to produce external patellar rotation. When the perpendicular falls into the center of the shaft of the third metatarsal ideal weight-bearing lines are established. This test not only estimates the degree of pronation but also furnishes a guide as to the amount of shoe correction needed to establish this position permanently. (1c): (Left view)—Illustrating patient standing in incompletely corrected shoes with patellar test showing internal line of weight bearing. Leg aches and low back pain persist. (1c): (Right view)—Illustrating patient completely corrected with patellar test revealing the perpendicular falling into the shaft of the third metatarsal. Complete and permanent relief of pain.

weight-bearing lines are thought to be as follows: A perpendicular dropped from the center of the patella should fall into the dorsum of the foot in an area around the shaft of the third metatarsal. The usual criteria of the second metatarsal does not seem to be correct. The major portion of the weight should fall on the outer border of the foot leaving the inner half of the long arch free and elevated. The three normal weight-bearing points are the head of the first metatarsal, the head of the fifth, and the tuberosity of the os calcis.

Examination for pronation should be made with the patient's legs bare to above the knees and dressing should permit inspection of the spine and pelvic crests. First, with the patient standing and facing the examiner, the feet should be elevated preferably towards eye level. If pronation is present, inspection reveals the following signs: abnormal prominence of the internal malleolus; presence of inward rotation of the foot at the ankle; bulging or lowering of the scaphoid on the inner border of the foot just anterior to the heel; and the presence of disproportionate weight bearing on the inner border of the foot, usually accompanied by inward rotation of the forefoot.

The patellar test has been found to be of importance in both diagnosis and treatment. At the time of first examination a central point midway between the borders of the patella is marked with an ink spot. A perpendicular from this point to the floor can either be estimated or actually dropped to determine its point of termination. If it falls internal to the central portion of the shaft of the third metatarsal we are dealing with pronation (Fig. 1a.) In extreme cases it may fall beyond the inner border of the foot, such patients giving the impression that "they are walking on the inside of their ankles. Placing the tips of the fingers under the central portion of the long arch, first on one foot and then the other, the foot is everted slowly. With this movement one will note that the patellar dot rotates outward. When the perpendicular, from this marker, falls into the shaft of the third metatarsal one can assume that pronation has been corrected (Fig. 1b). The same maneuver can be performed by grasping the knee in both hands and rotating it outward without touching the foot. With this movement one can note that the foot falls into the same position as found in the previous test method. This same patellar test has been found to be very helpful in determining whether prescribed postural foot correction is actually adequate. If insufficient, it will be found that, not only do symptoms persist, but also that the patellar still points inwards (Fig. 1c).

The third or radiographic test has been of such importance that it has in effect revolutionized our thinking as regards the entire problem. After it has been observed over a considerable period that postural foot correction relieved low back pain, it was only a short step to decide to investigate the possibility that changes in foot position might cause demonstrable changes in spinal alignment. In this connection it had always seemed paradoxical that patients having low back pain should be examined lying down, when all too frequently this position was accompanied by complete relief of pain. This observation gave added reason for studying spinal posture in the standing position.

In a series of patients having low back pain and sciatica, either alone or in combination, lateral radiographs of the lumbar spine and pelvis were made in the standing position. In our experience, measurements cannot be satisfactorily made on radiographs of poor quality. This technique demands highpowered equipment, and the clearest pictures are made with rotating anode tubes. First, a vertical wire plumb line is hung from the center of the upright examining table. At the level of the sacro-iliac joint, using the sacro-iliac dimples as a level guide, a lateral view is taken with the patient standing in his usual position of foot pronation. A second view is taken in exactly the same manner and location with the feet rolled outward in a position of extreme eversion. In the case of weak feet that find this eversion difficult, both tests are performed wearing shoes. Another anterioposterior view is taken with the patient standing. In addition to ordinary study, this view aids in determining differences in leg length.

Comparative measurements on each lateral picture are made using the following technique. Marking the posterior and anterior ends of the upper sacral articulation, a line is drawn connecting these points. At the posterior sacral mark, a line is drawn at exactly a 90° angle to the perpendicular line made by the hanging wire. The angle between the transverse line and the upper articulating surface of the sacrum is then measured by a goniometer. Since there is ordinarily

little movement between the bones of the pelvic ring, this measured angle has been found to be a satisfactory indicator for determining pelvic movement. Pronation consistently causes anterior pelvic tilt, and, conversely, eversion produces backward pelvic movement of some degree. By comparing these measurements, the degree of pelvic shift can be determined. It has been noted that with this there is a corresponding lesser movement in the fifth lumbar vertebrae, without a comparable measurable change in the upper four lumbar vertebrae. This, therefore, is predominately a movement of the pelvis which carries with it to a lesser degree the fifth lumbar vertebrae and is not a true lumbar lordosis (Figs. 2, 3, 4).

This was the link for which we had been searching. It served to prove that there was a very intimate relationship between foot and spinal posture. With further study, certain clinical observations were found to support and explain these radiographic findings. With internal rotation and pronation of the feet, it can be observed that there is inward rotation of the entire leg. With this internal rotation of the leg, the lesser trochanter must equally partake in this movement and actually moves posteriorly. Attached to, and encircling, the lesser trochanter is the insertion of the psoas major and the iliacus muscle. The iliacus originates on the internal upper surface of the ilium, while the psoas major arises from the anterior surface of the lumbar vertebrae. From these points the muscles fuse to pass over the ascending ramus of the pubis in the inguinal area and proceed to their final point of insertion. In all probability this is specially located in such a way that when the femur is rotated internally, and the lesser trochanter moves backward, there occurs acute shortening of the muscle aggravated by angulation at the pubic ramus. This acts to pull forcibly forward the upper surface of the ilium with the hip joints acting as a central axis. The pelvis, in this case, can be thought of as a bucket mounted on a central axle. When the front goes down, the back goes up. Posterior elevation could cause elongating pressure on the sciatic nerve with the point of maximum force occurring at the angle made by the nerve as it emerges from the sciatic foramen. Clinically this is supported by the fact that it is the first point of pain as sciatica develops and the last point to disappear even when recovery is well advanced.

It might be expected that the upper lumbar verte-

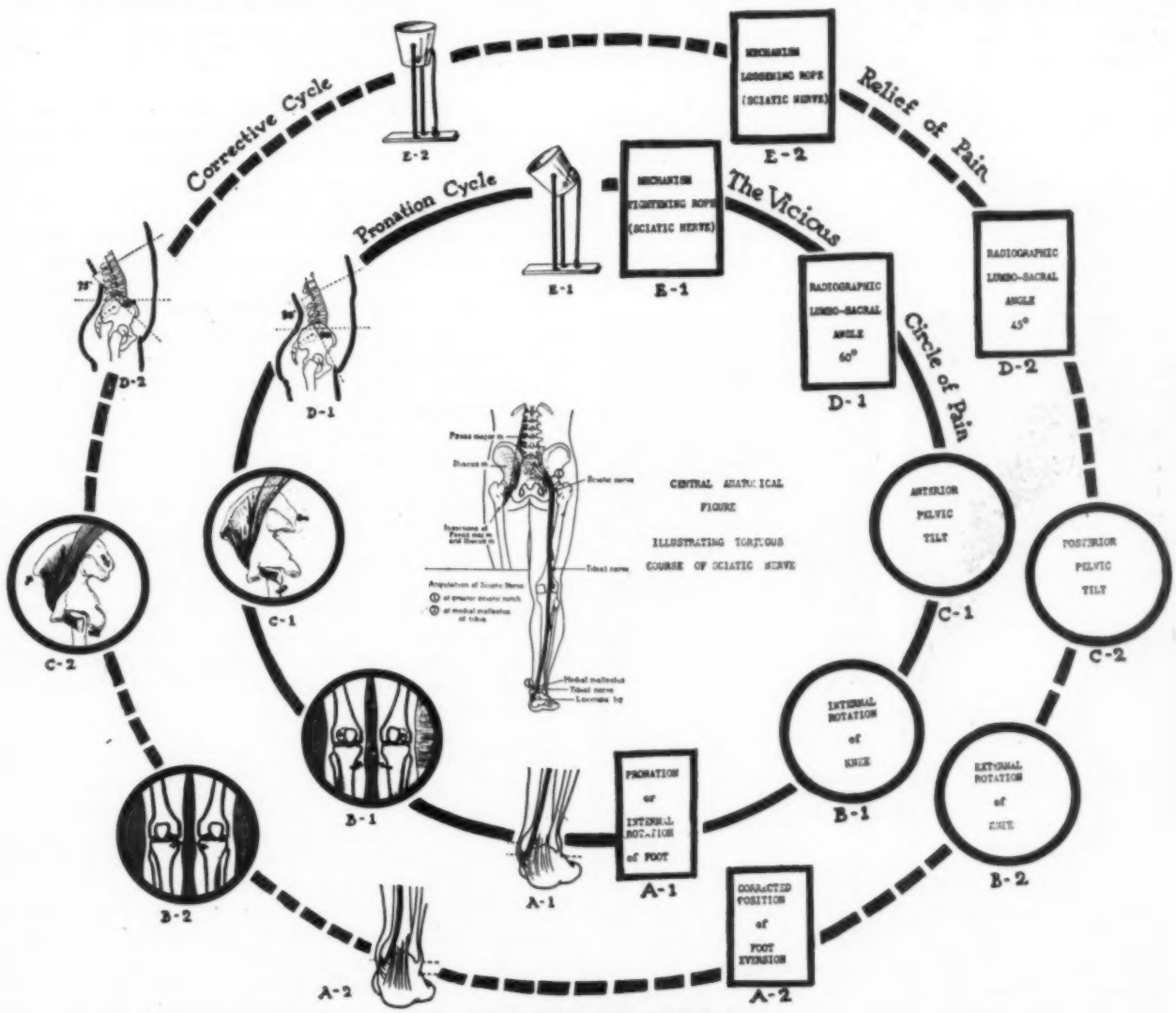

Fig. 2. THE PRONATION SYNDROME

Inner continuous-line circle illustrates the sequalae resulting from pronated feet. Lettered captions in corresponding opposite positions indicate the changes in posture accompanying pronation. Pain may or may not be present. Outer border on broken-line circle illustrates changes in posture that follow correction of foot pronation. This is accompanied by a marked tendency toward partial or complete relief of pain. Multiple deviations in weight-bearing lines are thought to be the cause of generalized fatigue. In the illustrative mechanism at the top of the Figure; E-1 and E-2—bucket, pelvis; central axis, hip joint; rope, sciatic nerve, fixed at both ends; posterior aperture, sciatic foramen. Sciatic pain is thought to be due to pressure on the nerve at under surface of sciatic foramen.

brae would be subjected to the psoas pull, actually they are not changed in position. As the iliacus seems to play the major role this has been termed the radiographic (iliacus) phenomenon. The word phenomenon in this sense is used to describe a physiologic demonstration of a previously unsuspected anatomical relationship (Fig. 2).

The following case histories are excellent examples of current methods of diagnosis and treatment.

CASE 1: Mrs. C.E.A., was first examined on February 8, 1945, at which time she was complaining of chronic low back pain. She gave an unusually chronic history of low back pain of 12 years' duration. During this period she had seen many regular and irregular practitioners. Treatment consisted of many different types of physiotherapy, and several series of varied injections. There were periods in which treatment was limited to manipulative procedures, and intervals in which she wore specially designed corsets and back supports. She states that the pain is usually located in the left lower lumbar region, radiating down the left leg. At the present time this is dull in character, having varied areas of secondary radiation. Of late, relief can no longer be obtained by lying down. In short, pain has become continuous night and day.

Examination reveals a middle aged female apparently in excellent general health. In the standing position it was noted that there was a slight total scoliotic curve to the left with the iliac crest slightly higher on the right. Measurement from the sacro-iliac dimples to the floor was, right 38½ in., left 38 in. On forward bending the lumbar segment was held rigidly and side bending was fairly well performed. In the supine position leg tests, such as straight leg raising, heel to knee, etc., did not give significant positive findings.

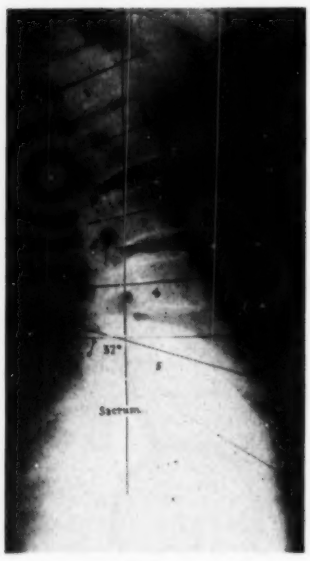

Fig. 3a.

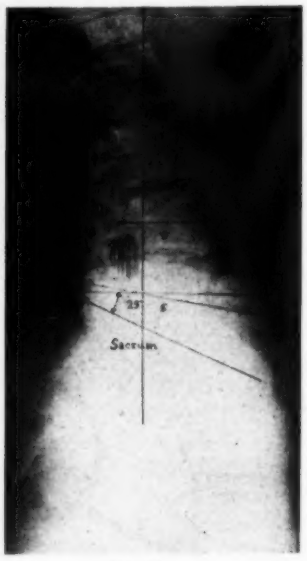

Fig. 3b.

(3a): Lateral radiograph taken at the level of the sacro-iliac dimples with patient standing in usual position of extreme pronation. The perpendicular is plumb line hanging from top of upright radiographic table. Transverse line is made at a 90° angle to perpendicular with oblique line parallel to the upper articular surface of the sacrum. The latter is used as an indicator of pelvic shift. Goniometer measures angle made between oblique and transverse lines. Sacral angle in pronation, 37° (Case 1). This position attended by chronic low back pain of 12 years' duration, completely resistant to therapy. (3b): Radiograph taken on same patient, level and upright position with feet in extreme external rotation or eversion. Sacral angle of 25°. Comparison with preceding view indicates a backward pelvic shift of 12°. This position, maintained by corrected shoes, has given complete relief of pain for the past two years.

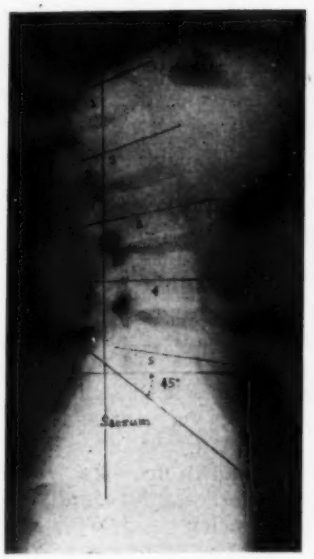

Fig. 4a.

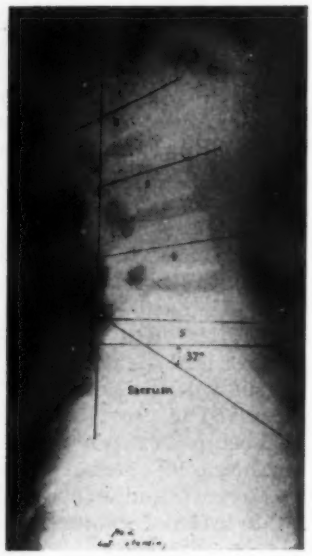

Fig. 4b.

(4a): Lateral radiograph taken and measured in the same manner as in 3a and 3b. In pronation there is a sacral angle of 45°. Acute back pain. (Case 2.) (4b): Lateral radiograph taken on same patient, manner, and level. Sacral angle of 37°. Comparison indicates a backward pelvic shift of 8° in foot eversion. In this position, complete relief of pain.

In the prone position, hyperextension and rotatory tests also were negative. In the standing position examination of the feet revealed the following: moderate pronation of both feet with some scaphoid prominences. The feet were abducted about 10° from the mid-line. Anterior arches were only slightly lowered in the central portion. Comparative radiographic examination revealed a positive iliacus phenomenon in that there was an upper sacral angle of 37° in pronation, while in eversion the sacral angle dropped to 25°. The difference between the two was 12°, a measure of backward pelvic shift. Anterio-posterior radiographs confirmed the difference in leg length found at time of clinical observation (Fig. 3).

This patient's faulty foot posture and difference in leg length was corrected by fixed correction, adding an internal heel lift to the shoe on the short side. It was necessary to modify her corrective devices for three weeks before internal rotation was finally eliminated. Within two weeks after this was completed the patient's backache disappeared and has not recurred to date. A radiographic check made in the corrected shoes revealed that the backward shift indicated in the preliminary test had been secured by postural shoe correction.

CASE 2: W.J.P., aged 30, an electrician, was seen complaining of acute low back pain and gave the following history. On May 21, 1946, at 4:00 P.M., lifted a heavy piece of cable and a half hour later noticed a dull pain in the low back region. Later, while working under a sink, there was a sudden increase in pain, so severe that he had to be lifted from this position. Patient was seen the following day and examination revealed a young male apparently in acute pain. He was walking with difficulty and with a marked list to the right. Local examination revealed muscle spasm of both the right and left lumbar segments, worse on the right. On forward bending the entire lumbar segment was held rigidly. Examination in the standing position revealed that the patient walked with the feet slightly abducted. There was moderately severe pronation with scaphoid prominences, accompanied by in-

ternal rotation of the entire leg as evidenced by the patellar shift. Other tests could not be performed because of pain. Radiographs were taken to determine the lumbo-sacral angle in pronation and eversion (Fig. 4). Comparative measurement showed a difference of 8°. Treatment consisted of inductothermy, sedatives for pain, and bed rest with local application of heat. Pronation of each foot was corrected according to methods that will be described. Within five days, patient's back pain was completely relieved and he has remained well since that time.

This patient is included in this series only because acute back pain is almost invariably a precursor of chronic low back pain. It is of further interest in that the patient, although having his first and only attack of back pain up to the present time, demonstrated a pelvic shift of a high degree. This would indicate its existence as a possible predisposing factor.

Postural Foot Correction

THE method of postural foot correction that will be described has enabled us to treat successfully certain symptoms that had previously resisted therapy of many kinds. Since the method has assumed this importance it seems necessary to describe certain key points in detail. Many practical finer points will be found in another report that is presently being prepared.

As has been mentioned earlier, postural foot correction divides itself into two parts, each equally important. The first is the selection of a well fitting rigid-shanked shoe. A rigid shank is a half-inch steel bar inserted between the inner and outer sole of the shoe on the inner side of the shoe. It is fixed at the heel and ends approximately in the area of the head of the first metatarsal. Men's shoes usually have this built-in feature. Women's shoes, however, are made in three styles: flexible, semi-flexible and rigid. Since only the rigid type is suitable the following test is recommended: Place the shoe on a hard surface and press firmly downward just in front of the heel. If the shoe buckles it is not used. The reason for this emphasis is that certain treatises even recommend the use of flexible shoes. It is our conviction that no adequate support can be built on a sagging base, just as "a bridge cannot be built on quicksand."

The second point is the individual correction of the suitable shoe—the word individual meaning that not infrequently the feet differ considerably from each other and require different correction.

Before the actual foot chart is prepared the patient is examined in the standing position. The presence of foot deformities is noted, such as bunions, hammer toes, shortness of the first as compared to the second metatarsal, etc. If of major proportions, operative removal may be necessary before foot imbalance can be properly corrected. If present in minor degree, postural foot correction may be attempted but is rendered less satisfactory by the presence of minor defects. An actual tracing is made of the foot after first demarcating the undersurface of the heads of the second, third and fourth metatarsals with ink. While this is still wet, the foot is firmly placed on the chart paper. Various points, such as the heel, posterior end of the internal malleolus, head of the first, etc., are then marked. Specially designed resilient inserts are then placed into plotted measured positions on the upper surface of the insole and then glued into position with rubber cement. Internal wedging of the heel is seldom used—never in women's shoes. External wedging of the sole is reserved for the occasional case that is found to be over-corrected. This procedure is not recommended, as ordinarily it increases pronation. The basis of the treatment is that the corrected shoe forces the foot into eversion as compared to initial pronation, producing external rotation of the leg and breaking a vicious circle. This restoration of ideal weight-bearing lines brings relief of symptoms.

A frequent pitfall defeating successful treatment is inadequate correction. Not infrequently inspection and the patellar test reveal the patient still pronating markedly while wearing the partially corrected shoes (Fig. 1c). This means revision of corrective measures, such as increasing long arch supports, adding inside lifts to heels and wedging the inner border of the soles. The final test can be made by using radiographic control. A lateral view in the standing position is taken with the patient wearing the corrected shoes. This can be compared with the previous pictures to determine if adequate backward pelvic shift has been obtained.

Discussion

SINCE this paper is primarily concerned with low back pain, this discussion will be limited largely to this phase of the subject. It is our considered opinion that long continued deviations in weight-bearing lines can produce secondary inflammatory changes and pain in any area whether this be foot, ankle, knee, thighs, or spine. In the beginning these are largely periarthritic although when long continued the intrinsic joint structures are finally affected.

The value of any different method of treatment must be judged by its actual result. It is difficult to tabulate, at this time, the more than 200 cases of low back pain that has been seen in the past four years. The reason for this is largely due to the recent changes in both diagnostic and therapeutic procedures. If, however, one considers that sciatica is only a subvariant of low back pain, the presence or absence of this symptom can be used as a yard stick to determine the cause of the condition and the success of the treatment. Twenty-six cases of sciatic were reported with the tabulation ending February 1, 1946. These were exhibited lately.* These were treated satisfactorily by the method described with only one being classed as a complete failure. There have been transient recurrences, the chief cause of which was found to be inadequate correction.

A study of a rather large series of cases complaining of chronic low back pain revealed that many have a similar pattern. Transient attacks of acute low back pain usually start in the early thirty's. These are of great intensity but of short duration. Since these are largely self-limited, various methods of treatment are given credit for speedy recovery. With the passage of years, the attacks come with greater frequency, with the duration of each attack increasing while free intervals decrease. Finally free intervals disappear and low back pain becomes continuous. In about one-fourth of the cases, unilateral sciatica developed as a terminal complication.

The role of disk protrusion has assumed such a large place in literature that it must be discussed. It is interesting to note that five patients complaining of sciatica had previously seen competent neurosurgeons who considered that this symptom was caused by disk protrusion. Operative removal had been advised but deferred by the patient. These patients responded to postural correction and have been symptom free for

*Scientific Exhibit, A.M.A. Convention, San Francisco, 1946. Seventh National Assembly of Surgeons, Mexico City, November 17 to 23, 1946.

periods of more than a year. These clinical findings that are the basis of this report do not support the statement that "95% of sciatica"[2] and "all low back pain"[3] are caused by intervertebral disk protrusion. On the other hand, we are aware of the fact that many patients have had relief from pain following removal of a protruded disk. All that can be said at this time is that conservative treatment of the type described, in our opinion, merits a trial before operative removal is recommended.

It is not necessary to detail all the methods that have been used for the treatment of low back pain. They are thoroughly familiar to all. It may be a commentary on the present status of therapy to record the fact that a large part of the public have acquired the belief that low back pain has become the especial province of the irregular practitioner. This is unfortunate but it does indicate that the present methods of treatment of low back pain leave much to be desired. Records give us the impression that whatever success is obtained by the cults is in the field of acute back pain. Frequently chronic back pain is made worse by manipulation, and in many cases of sciatic pain it may precipitate an attack of fulminating pain of increased severity.

In conclusion, in spite of the considerable period of time covered by this study, this must still be considered as a preliminary report. It is hoped that the different approaches that have been suggested will aid in the solution of the many diagnostic and therapeutic problems that still surround the subject of chronic low back pain.

Conclusions

A PRONATION SYNDROME is described in which primary pronation or internal rotation of the feet produces secondary internal rotation of the leg and forward pelvic shift. This last can be measured radiographically. Multiple postural shifts cause deviations in weight bearing lines which result in the appearance of one or all of the following cardinal symptoms: generalized fatigue, dull leg aches of various distributions, low back pain of various patterns, and sciatic neuritis or sciatica.

2. Postural foot correction of a special type establishes proper weight bearing and reverses the above series of changes.

3. Various different diagnostic and therapeutic approaches to the problems of chronic low back pain are described.

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AS FOR the 5 million 4-F's, the correct figure was not 5 million, but 4,217,000. Of these, 2,048,000 were the armless, legless, blind, the mentally diseased, the idiots, imbeciles, and morons. What medical care could have cured idiocy, brightened the morons, restored the amputated leg? Another 280,000 were syphilitic. Treatment for syphilis is offered freely everywhere. How could compulsory insurance have eliminated this group? If you continue this breakdown, you end up, not with 5 million, but about 1.5 million whose rejections might possibly be due to lack of medical care. And it is doubtful if compulsory insurance would have altered this figure. They did not, most of them, lack care because they could not get it. They lacked it because they had not been educated to want it.

—From "Socialized Medicine Bad Medicine for You," by MICHAEL WRIGHT, in *Des Moines (Iowa) Bet. H. & G.*, January, 1947.

The Action of Thioglycolic Acid and Thioglycolates on Animals after Subcutaneous Introduction

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A RECENT publication in this journal (INDUSTRIAL MEDICINE, 15:12, 669-676, December, 1946) encompassed the general aspects of thioglycolic acid and thioglycolate action with pointed consideration of primary skin surface effects and allergenic properties. In that publication need was indicated for additional information as to pathologic consequences deriving from subcutaneous, intravenous and inhalational introduction, together with appraisal of the extent of skin sorption. This present supplemental report is devoted chiefly to findings after subcutaneous injections although it is manifest that such procedure in no wise duplicates any step in cosmetic usage.

Work Materials and Procedures

THREE preparations were introduced, viz:

1. Thioglycolic acid, 84%, pH 2.0, diluted to 2.5%, pH 4.0.

2. Thioglycolic acid, 2.5%, partially neutralized with sodium hydroxide pH7.

3. Sodium thioglycolate, 3.58%, pH 8.6 (Commercial "Crowning Glory," a stabilized buffered solution of sodium thioglycolate).

A total of 85 rabbits and rats were utilized. This total includes 12 controls and 15 animals subjected to the neutralizing agent commercially employed along with thioglycolates. Likewise, this total embraces 12 rats into which were introduced intraperitoneally varying quantities of thioglycolates and neutralizer, all without consequential results. After prompt death or later sacrifice of animals, suitable organ material was removed for tissue examination. Greater detail is presented in Table I.

The Action of Strong Acids

SINCE all of the injuries encountered in these experiments are attributed to acid action rather than to any specific or peculiar properties of thioglycolic acid, there is introduced a quotation from Pharmacotherapeutics; Solis-Cohen; Githens; 1928; p. 508:

"When dilute acids are injected, or when enough is absorbed to alter materially the reaction of the blood, the respiratory metabolism and control is markedly influenced. All acids stimulate the respiratory center directly, like carbonic acid, and thus primarily increase the rate and depth of respiration. This leads to an increase in the escape of carbonic acid and at the same time, the alkali of the blood, which carries the carbon dioxide in the form of carbonates, is bound by the acid administered and the carrying power of the blood for carbon dioxide is thus enormously decreased. In a rabbit poisoned by intravenous injection of HCl, it was found that the solvent power of the blood was reduced from the normal of 25 volumes percent, to 2 volumes percent, about that of water. This decrease in the amount of carbon dioxide in the blood leads secondarily to depression of the respiratory center and weak respiration with resulting asphyxia. The acid seems also to interfere with the formation of carbon dioxide by the tissues. In the rabbit about 1 cc. per kilo of HCl is required to cause paralysis of the respiratory center. The heart is weakened by direct and central action and the blood pressure falls. The central nerve system is depressed, reflexes are weak and there is paralysis or

*From The Industrial Health Conservancy Laboratories, Detroit, Michigan.

TABLE I.
PROCEDURES

No. of Animals	Material Introduced	Quantity	Results
12	Control		
	SUBCUTANEOUS INJECTIONS		
	RABBITS		
2	10% thioglycolic acid	2 cc/kilo wt. (dil.)	No unusual manifestations
2	10% thioglycolic acid	4 cc/kilo wt. (dil.)	1 died—16 hrs. 1 survived—no unusual manifestations
2	10% thioglycolic acid	6 cc/kilo wt. (dil.)	Died—16 hrs.
2	20% thioglycolic acid	1 cc/kilo wt. (dil.)	Died—2nd and 6th day
2	20% thioglycolic acid	2 cc/kilo wt. (dil.)	1 died—1 day. 1 survived—no unusual manifestations
2	20% thioglycolic acid	3 cc/kilo wt. (dil.)	No unusual manifestations
6	5% thioglycolic acid	1 cc (dil.)	Sacrified for microscopic examination
3	5% thioglycolic acid	1 cc (dil.)	Sacrificed for microscopic examination
3	Sodium thioglycolate based on 3.58% thioglycolic acid	1 cc (dil.)	Sacrificed for microscopic examination
	RATS		
8	Sodium thioglycolate based on 4.75% thioglycolic acid	2 cc/kilo wt. (dil.)	6 died—24 hrs. 2 no unusual manifestations
6	Sodium thioglycolate based on 4.75% thioglycolic acid	3 cc/kilo wt. (dil.)	No unusual manifestations
8	Sodium thioglycolate based on 4.75% thioglycolic acid	4 cc/kilo wt. (dil.)	4 died—24 hrs. 4 no unusual manifestations
4	Neutralizing soln.	1 cc	No unusual manifestations
3	Neutralizing soln.	3 cc/kilo wt.	No unusual manifestations
4	Neutralizing soln.	4 cc kilo wt.	No unusual manifestations
	INTRA-ABDOMINAL INJECTIONS		
	RATS		
8	Sodium thioglycolate based on 4.75% thioglycolic acid	2 cc/kilo wt. (dil.)	No unusual manifestations
4	Neutralizing soln.	2 cc/kilo wt.	No unusual manifestations
	INTRAVENOUS INJECTIONS		
	RABBITS		
4	Sodium thioglycolate based on 4.75% thioglycolic acid	0.5 cc/kilo wt. (dil.)	No unusual manifestations

weakness followed by somnolence and coma. Convulsions may result from asphyxia. The neutralized acid is excreted by the kidneys and acts as an irritant diuretic as well as a saline one. The ammonia excretion is markedly increased and this leads to an increase in the total nitrogen excretion but a marked lessening in that of the urea. Calcium excretion is also increased. The temperature is low as a result of decreased heat formation."

Skin Ulcers

ON OR NEAR the third day, after subcutaneous implantation of thioglycolic acid, and at the site of such implantations regularly there appeared gross ulceration. These ulcers approximated the size of a 25c coin, were sharply punched out, the peripheries were regular and the walls were steep. The entire skin thickness was involved, and in one instance the entire abdominal wall was penetrated, exposing the abdominal viscera. These ulcers did not become obviously infected although there was microscopic evidence of purulence. These ulcers were slow in healing so that after twenty (20) days the original ulcer, although healing, had not healed. Microscopically the skin ulcers were characterized by dense scarring in the dermis and subcutaneous fat. From the introduction of the buffered thioglycolic acid, similar but smaller ulcers regularly appeared. The sodium thioglycolate produced no ulceration. Although thioglycolic acids as introduced may be accepted as an escharotic, similar action might arise from many other acids, particularly mineral acids, but not chromic acid, since in the last instance destructive action continuously leads to undermining ulcers. Thus these skin ulcers are regarded as a feature of the acid corrosive properties of thioglycolic acid.

Determinations and Urinalysis

THE blood specimens were prepared immediately following the postmortem bleeding of the animal. The bleeding was done within five minutes following death. Serum was separated from the clotted blood, care being taken to avoid hemolysis. However, this occurred to a slight degree in rabbits No. 75, No. 72, No. 86 and No. 83. Urine was withdrawn from the bladder by syringe. The varied results are assembled in Table II.

Blood Counts

PRIOR to and during the injection period elaborate blood counts were performed on control and test animals. These tests included enumeration of white and red cells, platelets, coagulation and hemoglobin determination, polymorphonuclear cells, stabs, lymphocytes, eosinophiles and basophiles. Since no significant changes derived from these examinations, an entire tabulation is not introduced, but as an index of the trend, specimen data are grouped in Table III. It does not appear that these blood findings may be interpreted to reflect significant injury, although there exists some evidence of active blood regeneration.

Organ Examination

(1) GROSS DOSAGE, and (2) multiple injection series.

After the sacrifice of these animals suitable micro-

TABLE II.
CHEMICAL DETERMINATIONS

	Thioglycolic Acid 84% pH 4.0						Buffered Thioglycolic Acid pH 7.0			Sodium Thioglycolate pH 8.6		
Rabbit:	81	82	83	84	85	86	72	77	79	54	74	75
BLOOD												
Non protein nitrogen	57	50	54.5	60	52	46	34.2	37.5	46	46	66.6	46
Sugar	114	195	129	178	200	333	121	285	400	127	250	250
Icterie Index	3	3	5	3	5	6.7	1+	3	3	3	3	5
Thymol Barbitone Test	0.2	0.4	1.0	0.6	0.4	1.0	0.2	0	0.2	0	0.2	0
URINALYSIS												
Color	Yel	Yel	Yel	Yel	Yel	Yel	Yel	Amb	Yel	Yel	Amb	Yel
Appearance	Cldy	Cldy	Cldy	Clr	Clr	Cldy	Cldy	Cldy	Clr	Cldy	Cldy	Cldy
Reaction	Alk	Alk	Alk	Acid	Acid	Alk	Alk	Alk	Alk	Alk	Acid	QNS
Specific gravity	QNS	QNS	1038	QNS	QNS	1030	1032	1041	QNS	QNS	1026	1030
Albumin	QNS	0	0	0	QNS	0	1+	0	QNS	0	1+	Trace
Sugar	QNS	0	0	0	QNS	0	0	0	QNS	0	0	0
Bile	0	0	0	0	—	0	0	0	0	0	0	0
Casts	0	0	0	0	0	0	Many Gran.	0	0	0	Occ Hyal.	0
White Blood Cells	0	0	Rare	0	0	0	Occ	0	0	0	Few	0
Red Blood Cells	0	0	0	0	0	0	Occ	0	Rare	0	Occ	Rare
Crystals	Few	Ca Carb	Ca Carb	Ca Oxyl	Ca Oxyl	Ca Carb	Ca Carb	Ca Carb	Occ Epi Cell	Ca Oxyl	Ca Oxyl	Ca Carb

TABLE III.
BLOOD COUNTS

Rabbit Number	Coagulation Time	Platelet Count	White Blood Count	Red Blood Count	Hemoglobin* in %	Hemoglobin in Grams	Poly- Stab	Lum- Mono	Eos- Baso
Controls before injection									
54	20 sec.	360,000	11,900	6,180,000	88.2%	15.3 gm.	33 —	58 — 1	2 — 6
75	60 sec.	310,000	12,900	5,130,000	70 %	12.1 gm.	39 —	52 — 4	1 — 5
Erythroblasts—15; marked anisocytosis and moderate poikilocytosis polychromasia									
After 5th injection									
54	20 sec.	410,000	7,300	5,060,000	76 %	13.1 gm.	44 —	44 — 8	— 4
75	45 sec.	360,000	10,100	5,610,000	76 %	13.1 gm.	50 —	37 — 8	1 — 4
Erythroblasts—11; marked anisocytosis; moderate poikilocytosis; same polychromasia									
After 9th injection									
81	60 sec.		13,000	5,210,000	80 %	13.8 gm.	46 — 1	39 — 8	— 6
82	60 sec.		13,000	5,380,000	80 %	15.2 gm.	46	44 — 4	— 4
After 17th injection									
81	60 sec.	480,000	11,000	5,220,000	76 %	13.1 gm.	54 — 10	30 — 1	— 5
82	60 sec.	500,000	12,800	5,560,000	80 %	13.8 gm.	34	58 — 3	1 — 4

* 17.3 gm = 100% Sahli Method.

scopic sections were examined, leading to the introduction here of representative specimen data and summaries.

1. *Rabbit No. 30:* Weight 7 lb. 11½ oz. Age: 1 year, 7 months. Injected with 1 cc. per kilo body weight (20% by vol.) thioglycolic acid into the muscle right rear leg. Survived 6 days after injection.

Gross Description: The specimen submitted consists of heart, lungs, liver and kidneys. The *heart* weighs 15 gm. and contains blood. The epicardial vessels are congested. The myocardium is pink and unaltered. The *lungs* together weigh 23 gm. Marked congestion is present, but no areas of frank consolidation are seen. The *liver* weighs 70 gm. It is yellowish brown in color. The surface is smooth and on cut section no lobulation or degeneration is visible. One *kidney* weighs 18 gms., the other 12 gms. They are identical in appearance, slate-gray in color, and on section pinkish-gray cortex and medulla is presented. The relation of cortex to medulla is normal, and there is peri-pelvic fat in the kidney.

Microscopic: *Heart*: Sections show normal epicardium, myocardium, and endocardium. *Lungs*: There is a moderate degree of chronic, passive congestion, no edema, no areas of consolidation. The *liver* shows marked chronic passive hyperemia, no parenchymal degeneration, and no portal inflammatory infiltration is in evidence. *Kidneys*: There is marked interstitial edema, and occasional cellular casts. The glomeruli, tubular epithelium are without change.

The pathologist thus summarizes the findings from the gross dosage series:

The principal pathological alteration in all tissues, except the heart, which appeared undamaged, is chronic passive hyperemia. This, in the lungs in some cases, is associated with a marked degree of edema, probably a terminal event.

The changes in the kidneys are variable, do not appear to be consistent with either the dosage or survival time. The most marked change, aside from congestion, is interstitial edema and inflammatory infiltration, seen in animal No. 30.

The changes in the liver are, likewise, variable and apparently not correlated with dosage or survival time. No frank parenchymal degeneration is present in the heart, kidney or the liver of any animal in this series.

2. On the multiple injection low dosage series, the pathologist makes the following comment:

Heart: The heart section of all animals showed fragmentation of fibers, variable in degree. This is interpreted as agonal and, therefore, not significant. There was no fatty metamorphosis, necrosis, or inflammatory infiltration.

Lungs: Acute congestion of all the lung sections was present. There was no evidence of pneumonia, and in the absence of an inflammatory process, the congestion was interpreted to be a terminal event and not significant.

Kidneys: The kidney sections showed acute congestion of the type seen in the lungs. In addition, an interstitial edema associated with scattered lymphocytic infiltration and mild vacuolar degeneration of the renal tubular epithelium was present in some. These changes, when present, were found in the papillae. A tabulation of the degree of papillary involvement follows:

Rabbit:	81	82	83	84	85	86	72	77	79	54	74	75
Interstitial Edema	±	0	0	3+	1+	2+	±	1+	2+	0	1+	0

Occasional old scars and occasional casts were present. The glomeruli and blood vessels were normal.

Livers: The greatest degree of change was seen in the liver section. It consisted chiefly of a vacuolar degeneration of the cytoplasm of the parenchymal cells in the central zone. In rabbit No. 79 the change took the form of a granular degeneration and was diffuse. The table shows the degree of these changes.

Rabbit:	81	82	83	84	85	86	72	77	79	54	74	75
Cytoplasmic Vacuolization	±	3+	3+	3+	3+	4+	0	2+	4+	0	1+	0

In rabbit No. 72 there was a mild infiltration of the portal spaces by lymphocytes.

In rabbits No. 79 and No. 74 myeloid metaplasia was present in the liver and the central veins of all animals were similarly congested. The bile ducts and portal branches were normal.

The histologic findings on the heart and lungs are not marked, and are to be interpreted as terminal events.

The scarring and minimal suppuration of the ulcers precludes any systemic effects originating from these areas.

The interstitial changes in the kidneys, while definite histologically, have not produced any renal insufficiency as judged by either the urine analysis or blood chemistry. Neither are they correlated with the amounts of thioglycolic acid which were administered. While the exact significance of these changes is not apparent at present, it is probably safe to conclude that thioglycolic acid does not have a serious effect on the kidney.

There is some correlation between the histologic parenchymal changes and the blood sugar levels, because rabbits No. 86 and No. 79 exhibited the greatest

histologic change and had the highest blood sugar levels. It does not follow, however, that this is related to thioglycolic acid administration because rabbits No. 86 and No. 79 received different amounts of the material. It must be noted, however, that on the average, the animals receiving the greatest amounts of thioglycolic acid had the most hepatic change, and those receiving the least had the least change. Further, there was great variation within each group. Moreover, the type of change is not that which results in permanent liver damage, but is a transient and reversible alteration. The low icteric indices and the negative thymol flocculation tests support the idea that the changes in the livers were not permanent or severe. The myeloid metaplasia found in two rabbits is suggestive of an active blood regeneration. This is, however, reflected in the blood picture of only one of the animals (No. 74).

Summary

THIOGLYCOLIC ACID (84%) (diluted), buffered thioglycolic acid and sodium thioglycolate (4.75%) and less were subcutaneously injected in varying amounts into rabbits and rats. A few injections were introduced intramuscularly, intraperitoneally and intravenously.

At every site of introduction of thioglycolic acid, large, severe skin ulcers regularly appeared which were slow to heal. This action is attributed to the acid properties of the preparation. The partly buffered thioglycolic acid provoked mild ulceration. Sodium thioglycolate induced no ulceration.

No histologic evidence reveals damage to the heart or lungs. The interstitial changes in the kidneys, while definite, did not produce renal insufficiency as revealed by urinalysis or blood chemistry. The extent of renal damage could not be correlated with the quantities of thioglycolic acid introduced.

The most significant evidence of damage was observed in the liver sections. Vacuolar degeneration occurred in the cytoplasm of parenchymal cells in the central zone.

Some correlation was established between parenchymal changes and blood sugar levels.

In general those animals receiving on the average the largest quantity of thioglycolic acid present the greatest hepatic changes encountered.

None of the pathology established derived from those animals injected with the 3.58% of sodium thioglycolate.

Single injections (above 5%) of thioglycolic acid in amounts at and above 1 cc. per kilo promptly led to the death within a few hours or days of approximately 50% of rabbits. Organ examination disclosed no significant damage. These deaths are attributed to acid properties of the substance. Lower concentrations in comparable amounts and multiple subcutaneous injections up to 20 as appraised through histologic, blood chemistry, and urinary examinations on rabbits provided no evidence apart from skin ulcers from acid action, of any severe, permanent or irreversible damage from thioglycolic acid.

Sodium thioglycolate based respectively on 4.75% thioglycolic acid (intravenous) and on 3.58% thioglycolic acid (subcutaneous) produced in rabbits no demonstrable deviation from the usual.

Rats are more susceptible to the action of sodium thioglycolate. Irregularly 50% of rats succumb within 24 hours to 2 and 4 cc. per kilo of sodium thioglycolate based on 4.75% thioglycolic acid. In other comparable lots all rats survived without unusual manifestations. These deaths in rats may not be attributed to acid action.

Scrotal Swellings

—In Industrial Medical Practice—

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WHILE the diagnosis and treatment of scrotal swellings does not form a large part of the practice of industrial physicians, yet these conditions do merit special study. Because of the importance of the testis to the individual, these lesions demand far more attention than their purely medical importance would warrant.

Understandably, every workman thinks his testes are exceedingly valuable. We might add that this is quite true of doctors and insurance men as well. Therefore any injury to the testes is the cause of considerable anxiety and concern to the patient. Unless properly and sympathetically treated, such conditions may lead to protracted disability and psychoneurotic symptoms not explainable by the lesion itself.

We see, however, that the Illinois Compensation Board is rather matter of fact about these intangible values and allows the same compensation for the loss of one testis that it allows for the loss of hearing in one ear. The loss of both testes is considered to be compensable to a slightly greater degree than total loss of hearing in both ears but not quite as compensable as loss of one hand or one leg. Many people would dispute these estimates of comparative values; we merely mention them for their incidental interest.

The main purpose of this discussion is to give a short description of the examination necessary in these cases and then a review of the condition causing such swellings, pointing out the more important relations to industrial medicine as we proceed.

To any group of men practising industrial medicine it is superfluous to do more than mention the importance of a detailed history of the exact time, nature and circumstances of any injury. The time of occurrence of the swelling, whether immediate or delayed, should, of course, be definitely ascertained and noted. The presence of associated symptoms, such as pain, should also be noted and if present, an exact description of the location, character and other details.

When examining this type of case, it is well also to ask about the presence or absence of urinary symptoms, such as difficulty in urinating, frequency, or presence of pain or any other disturbance of voiding. The presence of urethral discharge, either continuous or in the morning, should also be asked about.

Some other general questions should always be asked. The presence of weakness or weight loss should be determined. It is important to try to learn whether any of these symptoms were present before the time of the alleged injury, and so it is well to obtain such information as part of a general questioning after the story of the specific injury has been determined.

The examination of the immediate area involved should of course be thorough, since it is the source of the most helpful findings in diagnosis. The local of the swelling is most important. Is it unilateral or bilateral? Does it involve the scrotum or only the scrotal contents or both? If in the scrotum itself, is it a local or diffuse swelling? If it involves the scrotal contents, is it in

Presented at the Midwinter Scientific Session of the CENTRAL STATES SOCIETY OF INDUSTRIAL MEDICINE and SURGERY, December 6, 1946.

the testis, epididymis or the cord structure? The size of the mass should be exactly recorded and also its consistency and contour and the presence of tenderness. The exact location of the point of maximum tenderness may be helpful in those cases where this finding is present.

Transillumination is an important aid in determining the nature of swellings or accumulations and should be used in every case. Where accumulation of fluid makes exact palpation difficult, it is wise to aspirate the overlying fluid in order that palpation of the underlying structures may be carried out with a greater degree of accuracy. Surgical exposure and biopsy only rarly necessary, but in the unusual case may have to be resorted to.

The examination, of course, should include exact determination of the condition of the adjacent spermatic cord structures and inguinal areas on the involved side, as well as of all the structures of the opposite side.

It is essential in most cases to do a thorough examination of the other portions of the lower genitourinary tract as well. The necessity for this will be obvious later on. The urethra should be examined for discharge. The urine should be thoroughly examined, both first and second glass specimens, with microscopic examinations of both. The prostate and seminal vesicles should be examined by a rectal palpation and the fluids from these organs examined microscopically. Occasionally more elaborate studies, such as cultures, are called for but only in unusual cases.

The most important group of conditions, both from the standpoint of the patient and of the doctor, is that which includes lesions involving the testis itself.

Injury to the testis is almost invariably the result of direct trauma, such as a blow. It is not as common as one might expect, since the testis, due to its mobility and the cremasteric reflex, frequently avoids a direct blow. However, such injuries do occur and may be of all grades of severity from mild contusion to complete crushing. Usually injuries are accompanied by severe pain and a rather marked degree of systemic reaction with weakness, pallor and even syncope. There is usually obvious evidence of the injury in the form of swelling or laceration of the scrotum and surrounding tissues and sometimes the testis may be dislocated up over the abdomen or into the inguinal canal or perineum, a condition known as luxation.

The more severe injuries should naturally be treated in a hospital. The milder contusions which form the majority of cases will require only rest, elevation of the involved testis and the application of cold. Sometimes mild pressure with an elastic bandage or support will prevent excessive increase in size due to edematous swelling, to which this area is very susceptible.

If the injury is more severe, there may be bleeding into the tunica vaginalis and formation of hematocele. In such cases, if there is considerable tension, the pain may become quite severe and can sometimes be relieved by withdrawal of some of the bloody fluid from the sac. Treatment is usually conservative unless the severity of the injury necessitates surgical intervention for control of hemorrhage, repair of lacerations, or correction of luxation. Where the testis is severely crushed and the testis on the opposite side is unharmed, immediate removal may be the best procedure since, unless a good anatomical repair can be made, convalescence may be unduly prolonged and the testis eventually lost anyway. Atrophy of some degree may follow even minor injuries.

Torsion of the testis is a rather rare condition in which the testis becomes twisted on its vascular pedicle with resultant strangulation of the circulation. It was formerly thought that this followed only after indirect muscular effort of a severe degree. However, cases have been seen in which torsion occurred while the patient was going about his ordinary activities or even sleeping. It is now believed that the condition is due to a congenital looseness or lack of fixation of the testis to its surrounding envelopes, and not due to injury.

Torsion is accompanied by severe pain and shock and is followed rather promptly by an acute swelling of the testis and its adjacent structures. The testis is usually found in a higher position than normal due to the shortening of the cord which results from the twisting. If the anatomic landmarks of the testis can be made out, they will be found to vary from the normal pattern. If the condition is recognized promptly, it is sometimes possible to do a manual untwisting. Usually operative exposure is called for, with an attempt to relieve the strangulation by untwisting and fixation of the testis in its proper position. If this is not done, torsion is almost invariably followed by complete atrophy.

Tumor of the testis is very important not from its frequency but because of the serious prognosis which accompanies the condition unless early removal is done. We will not go into an extended discussion of testis tumors but merely say that they are all thought to be teratoid in nature. They occur most commonly in young adults twenty to forty years of age. They metastasize by way of the lymph channels to the lumbar nodes and spread by way of the thoracic duct to the lungs. If untreated, they are uniformly fatal. These tumors are symptomless in their early stages except for a gradual increase in the size of the testis. The findings on examination may be only those of an increase in the size of the testis itself, or a mass involving the testis. If spread has already occurred to the lumbar nodes, there may be a palpable abdominal mass. If there is lung involvement, there may be hemoptysis and shortness of breath.

Most of these tumors form hormonal products similar to the gonadotrophic hormones of the anterior pituitary and placenta, and these may be detected in the urine by the Zondek test. This is done with immature white mice or with rats. The usual Friedman test, using rabbits, such as is commonly used for pregnancy diagnosis, is not sufficiently sensitive.

The treatment for testis tumors is immedate surgical removal, followed by intensive roentgen therapy of the lumbar, mediastinal and lower cervical regions, whether or not there is any evidence of metastatic spread.

The importance to industrial medicine of this condition is more indirect than direct, and it results from the fact that it is sometimes claimed that testis tumors have arisen as the result of an injury to the testis. This question was formerly much disputed, but at present the consensus of opinion among urologists all over the country is that testis tumor does not arise as the result of trauma. Many of these cases will give a history of injury, often of a minor degree, following which a painless swelling is noticed which then is found to be a tumor. Most urologists believe that in such cases the trauma has merely called attention to a pre-existing early tumor mass. One authority has stated that he thought the presence of a mass in the testis would make it more subject to minor injuries inasmuch as the usual protective cremasteric reflex would not be as effective as in the normal. Despite

these authoritative opinions, cases of testis tumor still appear before industrial commissions with the claim that the tumor was the result of injury. Such a claim, we feel, cannot at present be substantiated.

Inflammations of the testis iself, unassociated with those of the epididymis, are rare and are seen in only two conditions, luetic involvement or gumma and the orchitis of mumps. Gumma of the testis is sometimes confused with tumor because it presents a localized, painless, insensitive swelling of the testis. The serologic tests are positive and the mass recedes on adequate anti-luetic therapy. Such a lesion is, of course, not the result of trauma. The orchitis of mumps presents no difficulty in diagnosis as the preceding parotitis makes the nature of the involvement self-evident.

Other inflammatory lesions of the testis are practically always accompanied by and are usually secondary to inflammations involving the epididymis. This is true in the case of specific infection with the gonococcus. In these cases infection has usually been the result of direct spread along the genital ducts from the prostatic urethra to the epididymis. Whether such spread occurs directly along the lumen of the vas deferens or through the accompanying lymphatics or venous channels is not yet definitely established but clinically it makes no difference. Such spread may be accelerated by severe physical effort, probably due to the increased abdominal pressure that accompanies such effort, with spread of infection from the intra-abdominal portion of the genital tract to the epididymis. To the industrial physician this factor is not so important in the case of gonorrhea, since this condition is not in any event compensable. Of course it is essential that a diagnosis of gonorrhea must be definitely established on the basis of smears or cultures.

Non-specific epididymitis is now seen just as frequently or more frequently than the specific types. The retrograde mode of infection described above for gonorrheal epididymitis may also occur in non-specific infections. To what extent such a mechanism may lead to compensable conditions is still the subject of much dispute. It is true that non-specific epididymitis can be the result of hematogenous spread of bacteria from foci elsewhere in the body. It is likewise true that non-specific epididymitis may follow non-specific prostatitis in cases in which there has been no element of trauma or strain. Therefore, in order that a non-specific epididymitis be properly considered to be the result of injury, the presence of a very definite sequence of events must be established. The mere fact that on one day a man lifted a box and several days later that his testis swelled up does not establish the lifting as the cause of the epididymitis. Most of the cases of epididymitis, which we see in urologic practise, give no history of physical effort. But in the case where extraordinary effort is immediately followed by pain referred along the spermatic cord or to the testis, and where swelling then supervenes, one cannot deny the possibility of aggravation or spread of the infection as a result of the extraordinary effort. Of course each case will have to be judged independently; no rigid rules can be laid down for reaching a decision that will be just and fair to all concerned.

The symptoms of acute epididymitis are fairly characteristic. There is pain, marked tenderness and swelling of the involved part. In the lesser infections or in the early stages, the lesion may be felt to be localized to a portion of the epididymitis, most often the tail. As the process extends, the entire epididymis and testis become a swollen, exquisitely tender mass in which no anatomic landmarks can be distinguished. A thorough examination of the urine and entire lower genito-urinary tract is necessary to determine the extent of the involvement and evidence of the presence or absence of previously existing infection. Treatment calls for restriction of activity, local support and chemotherapy and occasionally aspiration of hydrocele fluid. Only rarely is surgical drainage necessary.

It will often be found, on checking the urine and prostatic obstruction either from benign hypertrophy, manifestation of a diffuse genito-urinary infection due to chronic prostatitis; or it may be associated with prostatc obstruction either from benign hypertrophy, or carcinoma. In such cases there is usually no relation to trauma, although the patient may try to connect up the condition to some incident in his work.

There is a specific form of epididymitis which fortunately is not so commonly seen now as previously. This is tuberculous epididymitis. It causes a chronic, usually painless, irregular swelling which ordinarily starts insidiously in the head of the epididymis, whereas non-specific and gonorrheal epididymitis usually begin in the tail. The condition is always secondary to tuberculosis elsewhere in the body. It is not traumatic in origin. It is not a compensable disease but it sometimes happens that an individual first notices the swelling after some minor contusion and thinks it to be the result of the contusion. In such cases the nature and location of the swelling and its progressive nature are helpful in making a diagnosis. The examination of the prostate and seminal vesicles may uncover evidence of disease in these organs and examination of the urine in some cases will show pus cells and even tubercle bacilli, since frequently there is urinary tuberculosis as well. Treatment consists of epididymectomy and also measures directed to the patient's general health.

True tumors of the epididymis are exceedingly rare. There is one form of swelling called spermatocele which is frequently seen and may be the cause of some trouble in differential diagnosis. This forms a painless, symptomless, elastic swelling usually separate from and above the testis. Occasionally a patient will attribute such swelling to an injury. The spermatocele is really a diverticulum of the epididymis or first portion of the vas. Its nature is easily determined by the fact that it is firm, elastic, not tender and transilluminates well. An aspiration yields an opalescent white fluid which, on microscopic examination, shows spermatozoa. Such a condition is, of course, not compensable.

One of the commonest causes of scrotal swelling is an accumulation of fluid in the tunica vaginalis which surrounds the testis. We mentioned above the cases where there is traumatic bleeding into this space with the result that a hematocele is formed. As mentioned there, aspiration of blood may be occasionally desirable. If this is not done and the blood cots, a firm, insensitive mass may be formed, which can be very difficult to distinguish from a testis tumor. Occasionally in such cases the differentiation may not be made without surgical exploration.

The most common swelling of all is hydrocele of the tunica vaginalis. There is normally a minute amount of fluid present in this sac which is embryologically an isolated portion of the peritoneal lining. Under certain conditions, such as the presence of an acute inflammation or tumor, excess of fluid accumulates. In these cases the reason for the accumulation is probably an excess formation of fluid and such fluid may be exudative in character, containing pus cells or red blood cells. In most instances there is no obvious cause for the accumulation and some deficiency

in the resorption mechanism is postulated. These cases of so-called idiopathic hydrocele form the largest group. Most often no direct cause can be assigned.

In some instances they may be post-traumatic, in which case they are compensable. A small accumulation of hydrocele fluid is not uncommon after mild trauma or contusion. It ordinarily requires no treatment unless there is unusual tension, in which case aspiration of the fluid may bring some relief of pain. Ordinarily the condition subsides spontaneously. In some cases, however, an enlargement persists. Aspiration may be done one or more times, but if the fluid continues to re-accumulate, more radical treatment is necessary. Injection therapy is advocated by some men but may be followed by unpleasant complications in the form of severe orchitis or recurrence. Surgical removal of the parietal portion of the sac is still the preferred treatment for persistent hydrocele.

There is another form of scrotal swelling with which you are all too familiar but which is occasionally the cause of difficulty in differential diagnosis—namely, scrotal hernia. We shall do more than mention it here.

Of the diseases of the spermatic cord only one is common. Tumors are very rare, being chiefly sarcomas arising from the connective tissue structure. Occasionally hydrocele of the cord may be found but is seen mostly in children. The condition known as varicocele is very frequently seen and occasionally may be alleged to be the result of injury and a reason for compensation.

The varicocele is a dilated condition of the spermatic veins of the pampiniform plexus. It is probably due to congenital factors related to the absence of valves in the spermatic vein and the manner in which the spermatic veins, particularly that on the left side, empty into the higher structures.

It is seen very commonly in adolescents and adults. In most cases it causes no symptoms but many of these individuals complain of dull aching referred to the groin or testis itself. The diagnosis is easily made. The mass of dilated veins is felt adjacent to or above the testis and is best felt with the patient standing. When the patient lies down, the weight of the column of venous blood is removed and the varicocele disappears to reappear again when the patient again assumes the erect position. The treatment in mild cases is support; in more severe cases surgical removal. This condition does not arise from injury and is, of course, not compensable, although frequently men will claim that the varicocele followed from effort.

There are a few conditions of the scrotum itself, rather than of its contents, which we must consider. One is edema due to circulatory failure. Occasionally this will be a prominent symptom of such failure and may cause the individual more concern than the other symptoms. Such swelling is, of course, bilateral and it is easily determined on palpation that the swelling is in the scrotal tissues rather than in the testis. It is, of course, accompanied by dependent edema of the lower extremities. The treatment is that of the causative cardiac condition. Occasionally chronic edema of the scrotum may be seen in cases where there has been previous infection of the inguinal nodes with blockage of the lymph drainage.

There is one form of scrotal swelling which is very important and is due to trauma of the perineum or perineal urethra—so-called straddle injury. In such cases there may be bleeding into the perineal tissues and the hematoma may spread and involve the scrotum. In such cases one must remember that there may be associated injury to the urethra as well. Sometimes there are such lacerations of the perineal urethra with hematoma and blockage of the urinary outflow, in which cases when the patient attempts to void there may be infiltration of urine into the perineum and thence into the scrotal tissues. This mode of spread is due to the fact that the superficial perineal space is a closed space posteriorly and laterally and connects anteriorly with the scrotum. Any fluid, whether blood or urine, which escapes into the perineal space will spread under the fascia of Colles to involve the tissues of the scrotum. Therefore, when such scrotal swellings are seen after injury, it is important to remember that the sources of swelling may be in the perineum or perineal urethra and it is to that point that the treatment must be directed.

Before closing may we again direct your attention to the very marked psychological upset which frequently accompanies any injury to the testis. Such disturbances may persist long after the original organic injury has entirely healed. Such things as persistent pain or neuralgia of the testis are all too common and very difficult to eradicate, being, as they are, frequently on a non-organic basis. This may lead to extended disability or claims of such and may be the cause of considerable legal complications.

There is another symptom which occasionally appears following testis injury and that is impotence. Seldom is this on an organic basis except in the rare case where both testes are severely damaged or there is severe injury to the perineum or to the spinal cord. For the very reason that it is a neurotic symptom, it may be most difficult to treat.

In closing may we reiterate our firm conviction that proper and sympathetic care and treatment of these conditions from the very beginning will usually secure the patient's cooperation and good will and prevent the development of such psychological symptoms; with great benefit to the patient, his employer, the insurance carrier and any others concerned.

DAY DREAMING is a potential cause of accidents but talking to one's self is no sign of mental instability, DR. LYDIA G. GIBERSON, industrial psychiatrist associated with the Metropolitan Life Insurance Company, yesterday told the Metropolitan chapter of the American Society of Safety Engineers. Speaking at a luncheon at the 400 Restaurant, she said that "often when I am sitting alone thinking over difficult situations I find myself speaking aloud." Her definition of individual conversation brought an almost universal nodding of heads in the affirmative among the 350 who attended the event. DR. GIBERSON emphasized good health mentally and physically as a major factor in preventing plant casualties. Among adverse influence, she pointed out, were fear, worry, hunger, anger, perverse inclinations and "show-off" tactics. "I am beginning to wonder if some of these causes may be in the background of some of the airplane and train accidents, which are occurring," she added. "Day dreaming where the imagination carries mind concentration far from immediate duty is a perilous deviation not only for an employee engaged in any hazardous occupation but also for the motorists," she added.

—*New York Times*, January 17, 1947.

A REQUIRED course in Industrial Medicine is to be given the juniors of Indiana University School of Medicine effective February 10, 1947. This is a new course in the school's curriculum and will give the junior one hour credit towards his degree. The course will be taught by LOUIS W. SPOLYAR, M.D., who will have the title of Associate Professor of Industrial Medicine. In the senior year the students have six hours of field work visiting plants and various medical departments. Thus, a total of 22 clock hours of industrial medicine will be given the graduates as part of their undergraduate training. This is a tremendous increase over the previous two hours of lectures in industrial medicine.

Industrial Medicine
Reg. U. S. Pat. Off.
The Journal of
Industrial Health, Traumatic Surgery and Occupational Diseases
Established 1932
Executive, Editorial and Publication Offices:
605 No. Michigan Ave., Chicago.
Editor: C. O. SAPPINGTON, M.D., DR. P.H.
Associate Editors:
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FREDERICK W. SLOBE, M.D., F.A.C.S.
Publisher: A. D. CLOUD.
Volume 16 **FEBRUARY, 1947** **Number 2**

Leroy U. Gardner

RESOLUTIONS adopted by the AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE of which DR. GARDNER was a Charter Member, a Fellow, and a Member of the Board of Directors:

IN EVERY group of men and women, some few stand out far above their fellows in character and achievement. Such a man was DR. LEROY U. GARDNER, whose ability and superiority in the medical profession, and particularly in the realm of occupational medicine, was unchallenged.

The death of DR. GARDNER marks the first break in the ranks of Members and Fellows of the AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE. In its distress over the passing of its eminent associate, the Academy in formal and sorrowful session has adopted the following resolution:

BE IT RESOLVED,

THAT, in the passing of DR. LEROY U. GARDNER, this Academy has been deprived of the constructive thinking and action of a highly learned and much beloved Fellow.

That the medical profession and all of industry throughout the world has sustained a great loss in leadership and constructive research in the field of occupational diseases.

That this Academy recognizes a tremendous and particular loss to the Saranac Laboratories, where DR. GARDNER for many years developed his major contributions to science.

That this Academy desires in the fullest measure possible to share the grief of DR. GARDNER'S family and of his intimate associates.

Accidental (?) Propaganda

WILL ROGERS, of beloved memory, often used the expression, "All I know is what I see in the newspapers." No doubt it never occurred to him that his words epitomized the habit that makes propaganda successful. This is an old habit and a strong one, far antedating the printed page. And the development of literacy and better means of communication seem only to have broadened its area, so that it becomes more general with every enhancement of our so-called progress. It was well described by Lucretius, 2,000 years ago, in phrases that might have been written yesterday: ". . . since all their wisdom is from others' lips, and all they seek is known from what they've heard and less from what they've thought." Familiarity with this habit has enabled modern propagandists to make giant strides in conditioning the people for whatever they want to put over. All of which leads up to something which, whether it was deliberately *put over* or not, certainly *got over* in a big way.

The Chicago Sunday Tribune, of January 19, 1947, in the last paragraph of a story about the report of the Chicago-Cook County Health Survey (see page 106), under the auspices of the U. S. Public Health Service, said as follows: "Health studies have brought out, it was emphasized, that *industrial employees* besides being subject to special occupational ailments *also have more non-occupational diseases* and a shorter life span *than other workers.*" (Italics ours.) The circulation of the *Chicago Sunday Tribune* exposed this statement to more than a million and a half people who bought the paper, and another million or more who read it; and now, of course, those who remember it have the impression that, since it was under auspices of the U. S. Public Health Service, it must be true.

IF THIS statement were true it would be startling indeed. But every informed person knows that *it isn't true.*

A little investigation discloses that the preliminary report stated regarding industrial employees, that they are: "peculiarly liable" to certain occupational diseases, and that they "have a tendency" toward other and more general diseases. (As to the latter, who hasn't?) This preliminary report was summarized in a publicity release which went to the newspapers, phrased as follows: "Industrial workers are prone to occupational diseases and to more ordinary illnesses than the general population." The third step was the published conclusion that if they're "prone" to them, they have them. Thus, the transition from *"peculiarly liable"* to *"prone"* to *"have."* The trouble is that few will read the report while many will remember the newspaper—with the effect that "industry," in the popular mind, is thereby saddled with one more undeserved reproach.

THE circumstances of this newspaper item are unfortunate at this time for several reasons. One is the trend of desire on the part of some officials connected with the U. S. Public Health Service toward a form of industrial medical service wherein the employer would provide, and pay for, complete medical care for employees. This trend has been much more apparent since the Wagner-Murray-Dingell bill died

without action in the last session of Congress—so apparent indeed as to create the strong impression that certain proponents of socialized medicine, if they can't bring it about by act of Congress, will endeavor to condition the public to a demand that will secure its accomplishment in other ways. The trend is expressed in such government-sponsored publications as, for example, the one entitled "A Modern Concept of Industrial Hygiene" in the December *Industrial Hygiene Newsletter*, which, in particular, has drawn considerable fire on the ground that it would not have been published unless it were part of a propaganda plan.

Another reason why the above-mentioned newspaper item was, to say the least, unfortunately phrased is related to the introduction this month in the present Congress of a new version of the Wagner-Murray-Dingell bill. Presumably this new bill, like its predecessors, will be referred to a committee, and hearings will be held at which testimony can be introduced. One kind of testimony which was loudly talked about, but on which there was practically no proof at the hearings last year, concerns the alleged public demand for government medicine. It was not pleasing to the advocates of the legislation that their statements regarding this public demand were not supported by evidence. Next time, therefore, they will seize upon every scrap of published information relating in any way to conditions from which a need or demand can be presumed, and each will be carefully catalogued as an exhibit. And among the exhibits, in a place of primary importance, will certainly be the published statement above noted, that "industrial employees .... have more non-occupational diseases ....than other workers." The authority for this statement will be given as the U. S. Public Health Service.

SUCH a presentation can be offset only by the facts. And these are that neither the fact of work, nor the work itself, nor the environment of work causes, or is responsible for, more non-occupational diseases than the workers would have were they anywhere else. The simple logic of the matter is that whatever diseases are caused by the work or its environment—in whatever kind of employment—are occupational diseases, and are so recognized. This is clearly set forth in the occupational disease laws of the various states.

Attempts have been made, from time to time, to show a statistical relation between the incidence of the diseases of ordinary life in selected industrial groups and the general population. Usually, however, the figures omit or suppress certain related factors without which the statistics are merely exercises in expression. In essence, they are as fallacious as Professor Whipple's famous example in which he showed a direct mathematical correlation between the consistency of asphalt pavement and infant mortality. The omitted common factor there, of course, was the temperature; the omitted common factor in the other statistical efforts is the economic status of those whose "proneness" to non-occupational diseases is being studied. Another element of first importance in every such comparison, although it is habitually ignored, is the fact that a non-occupational disability of the worker, however slight, is known about at his place of work and in connection with his work, whereas it would be a purely personal and generally unnoticed matter were he not working. In other words, the colds, the back pains, and the Monday morning hangovers become the subjects of statistics in industry, while, on the face of the statistical summaries, it may almost be assumed that the non-industrial people don't have them.

BUT the most careful presentation of the facts, published in every newspaper in the country, would not go very far toward correcting the wrong impression lingering in many minds from the above-quoted published statement to which we now take exception. We, therefore, note the statement, trace its origin, proclaim that *it is not true*, and urge that in any hearing at which it may be used, quoted or referred to, this editorial also be presented and put into the record.

Books

The Normal vs. the Handicapped

SELECTIVE JOB PLACEMENT by TOBIAS WAGNER, PH.D. Published by National Conservation Bureau, 60 John Street, New York 7, New York; 151 Pages, $2.50.

WITH the war over, industry is again faced with the problem of competition. Already consumer resistance to higher prices is evident. Since industry cannot exist without a fair return on its investment, it must seek fair profits, not through higher prices but through greater plant efficiency. This requires the optimum utilization of all the factors concerned with production, that is, machines, material and personnel. A book just published by the National Conservation Bureau deals exclusively with the efficient placement of workers—so as to ensure success for both employer and employee. It is the result of a more than two-year research study comparing a selected group of handicapped workers (once thought to be unemployable because of poor productivity and accident proneness) with a group of normal employees. Each disabled worker was watched and compared with a normal worker doing an identical job. It was found that when selectively placed at jobs, the handicapped group were superior in productivity and approximately equal in safety to the normal. Their production record was evident not only in their rate of production, but also in their larger salaries. The normal workers earned an average $49.22 per week, while the physically handicapped took home $51.21. The selective placement procedures that were found so successful for the physically impaired, the author reasoned, are applicable to all workers. He, therefore, includes the techniques to be considered in achieving the efficient employment of all personnel, disabled or not. There is some value in this approach to efficiency when we remember that management too often devotes much time and study to determining the most advantageous machinery and material to be used in its operations—but gives little consideration to the selection and correct employment of its personnel.

Cardiovascular Diseases

CARDIOVASCULAR DISEASES. By DAVID SCHERF, M.D., F.A.C.P., and LINN J. BOYD, M.D., F.A.C.P. Cloth. Price $10.00. Pp. 478, with illustrations. J. B. Lippincott Company, East Washington Square, Philadelphia 5, Penna.

THIS encyclopedic work on cardiovascular diseases is a complete rewriting and not a revision of a previous book on this subject by the same authors. They give a very complete and up to date but brief discussion of all aspects of cardiovascular disease except electrocardiography which topic is well covered in another book by the same authors, "Clinical Electrocardiography." "Cardiovascular Diseases" is well indexed. There is a very complete bibliography at the end of each chapter which contains more references to European and other foreign investigations than do many works on this subject. The practitioner who is not particularly interested in cardiology, should find this volume of great value.

—NATHAN SMITH DAVIS, M.D., F.A.C.P.

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Part of large audience at the Eleventh Annual Meeting of the Industrial Hygiene Foundation

Health in Industry

—Abstracts of Proceedings of the 11th Annual Meetings of the Industrial Hygiene Foundation of America, Mellon Institute, Pittsburgh, November 6, 7, and 8, 1946—

Reported by

C. O. SAPPINGTON, M.D., Dr.P.H.

IN ADDITION to an all-day program session on November 7, 1946, the 11th annual meeting of the Industrial Hygiene Foundation of America featured round table conferences on medical and medicolegal subjects and a concurrent conference on engineering subjects on November 6, 1946; and also on November 8, a similar conference on chemical and toxicological subjects. Attendance at these conferences was limited to members of the Foundation.

The medical conference was composed of the following subjects:

1. Beryllium.
2. Chemical Injuries to the Eyes.
3. Selective Job Placement.
4. Specific Job Training.

The medicolegal conference subjects consisted of a discussion of State Codes of Industrial Hygiene; and Medical Departments and Their Relationship to the Administration of Compensation Laws and the Adjudication of Disputed Injury Claims.

Discussions on the above subjects were given by DRS. GEORGE WRIGHT, C. F. KUTSCHER, RALPH S. MCLAUGHLIN, T. LYLE HAZLETT, LOYAL SHOUDY, CLARENCE SELBY, OSCAR SANDER, ELSTON BELKNAP, ROBERT KEHOE, and C. O. SAPPINGTON, and MR. THEODORE C. WATERS, and MR. J. J. BLOOMFIELD.

The subjects considered in the engineering conference were as follows:

1. Radiant and Convectional Heat Control in Hot Industries.
2. Control of Fumes from Metallurgical Electric Furnaces.
3. General Atmospheric Pollution.
4. Man and the Machine.
5. Dust Collection.
6. Windowless Factories.

These discussions were conducted by PROF. PHILIP DRINKER, as chairman of the conference, and W. C. L. HEMEON, secretary, participants among others being MR. THEODORE HATCH and DR. WILLARD MACHLE. There was considerable discussion from the floor, with many participants. This, the second of the series of engineering conferences, was one of the most successful meetings held during 1946.

The conference on chemical and toxicological subjects was conducted by DR. H. F. SMYTH, JR., and considered the following subjects:

1. Comparative Toxicity of Chlorinated Hydrocarbons.
2. Warning Labels upon Hazardous Chemicals.
3. Evaluation of the Hazard of Siliceous Dusts.
4. Chemical Burns of the Eye.
5. Skin Penetration of Chemicals.
6. Evaluation of the Hazard of Contact Dermatitis by Experiment.

Program Sessions

THE program sessions on November 7, at which MR. ANDREW FLETCHER presided, had for their theme "Production Comes from People." The program follows:

"Advances in Industrial Health," ANDREW FLETCHER, Executive Vice-President, St. Joseph Lead Company, Chairman, Industrial Hygiene Foundation; and JOHN F. MCMAHON, Managing Director, Industrial Hygiene Foundation.

"Production Comes from People" (keynote address), ADMIRAL BEN MOREELL, formerly Federal Coal Mines Administrator; President, Turner Construction Company.

"Trends in Industrial Health Administration Practices," C. O. SAPPINGTON, M.D., DR. P.H., Consultant in Industrial Health, and Editor, INDUSTRIAL MEDICINE.

"Findings from Foundation Plant and Laboratory Researches," THEODORE F. HATCH, F. R. HOLDEN, and W. C. L. HEMEON.

"Leroy U. Gardner, M.D.," A. J. LANZA, M.D., Chairman, Medical Committee, Industrial Hygiene Foundation.

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Health," R. H. PASS, President, Onondaga Pottery Company.

"Respiratory Ills and Their Control in Industry, with Special Reference to Influenza Immunization," ANNA M. BAETJER, SC.D., Assistant Professor of Physiological Hygiene, The Johns Hopkins University.

Discussion—C. RICHARD WALMER, M.D., Industrial Hygiene Foundation.

"Recent Research on Chemical Injuries to the Eye," RALPH S. McLAUGHLIN, M.D., Consultant in Industrial Ophthalmology.

Discussion—C. F. KUTSCHER, M.D., Consultant, Industrial Hygiene Foundation.

"Legal Developments Respecting Occupational Health," THEODORE C. WATERS, Mullikin, Stockbridge & Waters; Chairman, Legal Committee, Industrial Hygiene Foundation.

Discussion—J. J. BLOOMFIELD, Assistant Chief, Industrial Hygiene Division, U. S. Public Health Service.

"Legal and Administrative Handicaps to a Rehabilitation Program," B. E. KUECHLE, Vice-President and Claims Manager, Employers Mutual Liability Insurance Company; Member, Foundation's Legal Committee.

Morning Session, November 7

MR. ANDREW J. FLETCHER opened the meeting with three questions:

1. What good is a machine that is 90% efficient in the hands of a man who is only 50% efficient physically?
2. Is the government or are the unions better able than management to improve the efficiency of American industry by bettering working and living conditions?
3. How can the Foundation aid industry, and especially its own members, during the coming years?

1. 'Good health is the most important asset in life. I know of no company that has improved working and living conditions of its employees that has not obtained satisfactory returns in dollars as well as in human happiness. It is even more foolhardy to neglect the health and safety of workers than to neglect the maintenance of a machine. The reason why management may not have always taken the lead in maintaining health is probably because other problems seem more important. The title of the Foundation's new information bulletin, "Production Comes from People," indicates and confirms my opinion that there is no more important problem today than the improvement of working and living conditions of the American people. The answer to my question, what good is a 90% efficient machine with a 50% efficient workman, is 45%.

2. 'The mine workers' welfare fund is now reported to be over $2,000,000 and we constantly read of larger and larger appropriations for state and Federal industrial hygiene funds. I do not object to the purposes for which the contributions are being obtained, but I do believe that management is at fault in not taking the leadership in the expenditures of funds of this type.

'All men may be created equal, but all men certainly do not remain equal. The United States is today the leading nation in this world because of its natural resources, the greatest of which are not underground wealth, but the integrity, energy, and freedom of our people. In my opinion, one of our principal losses during this war was the loss of respect on the part of the American workman for his government and for his employer. It will take some time to rebuild the respect of the employees and the public for management, and I know of no better way for management to start than by taking the lead in improving working and living conditions.

3. 'The Foundation can help industry in its effort to improve working and living conditions by making surveys of its operations and by offering recommendations based upon research to correct any hazards.

'Fortunately, the company with which I have been actively associated for the past 17 years, the St. Joseph Lead Company, which is the largest miner of lead ores in the United States, was one of the first to become interested in lessening accident hazards and in improving working and living conditions. I was recently asked to have filled out an extremely complicated questionnaire as to what is the indirect cost of accidents. I replied that, in my opinion, the effort was not worthwhile, as we felt that, even though our direct cost had decreased from 3.51 dollars per $100 of wages and salaries in 1923, to 86c in 1945, we were just as much interested in a further reduction and our men did not need assumptions that the indirect cost was two, three, of four times the direct cost. The decrease we obtained was not because of luck, or because of union demands, or because of government regulations, but it was because of careful supervision on the part of management and by increasing the cost of the safety department from 10c to 50c per $100. The Foundation has made surveys of our accident and fume hazards—it can do for you what it has and will continue to do for us.

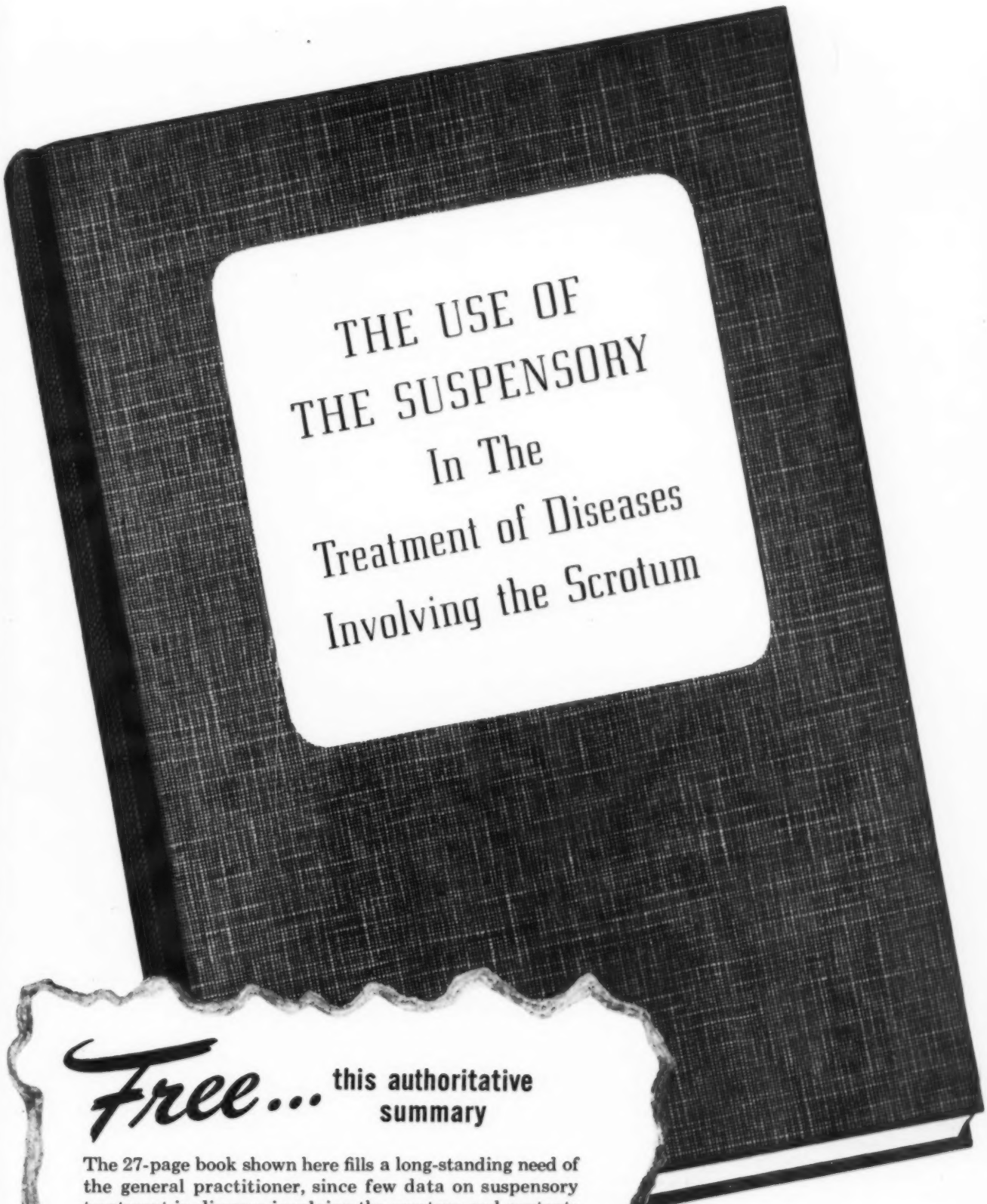
'The development of healthy working conditions should be the one common meeting ground of agreement between management and labor in the difficult days that lie before us. I am sure that the Foundation can give its members constructive suggestions if it is asked, and, when facts are available, then management and labor should be able to develop plans for the furthering of their respective interests and thereby regain the respect in one another's integrity without which a satisfactory relationship is impossible.'

MR. JOHN F. McMAHON, Managing Director of the Foundation, gave a short summary of the Foundation's progress in 1946, which included the following highlights and comments:

1. 'There is a pronounced trend toward industry-wide studies to improve employee health and working conditions. Such a study was completed early in the year for the pottery industry; a similar investigation is now in progress for the National Industrial Sand Association. A project has been carried out for the lead industries and further work for that association is being planned. A start has been made in the refractories industry with three representative companies. Projects have been authorized by both the Grinding Wheel Manufacturers and the Abrasive Grain Association to be undertaken soon. A number of companies in the glass industry have joined together in authorizing the study of a special problem. Two other industries, through their associations, have approached the Foundation to discuss industry-wide studies. This is the efficient, economic way to work for all concerned. We welcome projects of this type; further, they enable the Foundation to utilize its specialized staff to the fullest.

2. 'A new plan of organization has been developed within the Foundation this year. Besides the Medical, Preventive Engineering, and Legal Committees, a new professional committee was appointed on Chemistry and Toxicology. This is headed by DR. HENRY FIELD SMYTH, JR., of Mellon Institute. Meanwhile, appropriate members of the Foundation's permanent staff have been appointed secretaries of the four standing committees, to assist the chairman. One function of these committees is to arrange informal, round-table conferences for professional and technical personnel from Foundation member companies. These conferences, with which the engineers pioneered last year, were expanded this year to include a Medical, Medicolegal, Engineering, and Chemical and Toxicological conferences. These conferences are in effect expanded meetings of the respective Foundation committees involved. They are strictly limited to professional and technical specialists from member companies. The sole exception is when an individual is invited to discuss some point of the agenda. It is hoped that they may become year-round functioning vehicles for the interchange of practical data and experience—informal organizations within the Foundation.

3. 'DR. C. RICHARD WALMER was appointed to the Foundation's staff in July as a full-time Medical Director. His acquisition promises to expand further the Foundation's services to its member companies and to increase our medical activities. Meanwhile, we announce the appointment on October 1 of DR. C. HOWARD MARCY as a consultant on the Foundation's staff. The Foundation's staff is a team of specialists in medicine, engineering, chemistry, backed by the resources of the Mellon Institute which, through this staff, are at your disposal. Besides extensive



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plant surveys conducted during the year, the staff has assisted several members in planning new plants to insure the maximum in good physical working conditions.

4. 'The following new trustees have been elected to the Foundation Board: MR. H. G. BATCHELLER, President of Allegheny-Ludlum Steel, MR. ARTHUR A. BATTS, President, Carborundum Company, and MR. M. W. THOMPSON, Treasurer and General Manager of The Hall China Company.

'Besides the Transactions of the last annual meeting, which were published in four parts, the bulletin in the engineering series on Measurement of Air Flow in Industrial Ventilation was totally revised and republished. New bulletins are in the process of preparation in the Medical, Engineering and Legal series. We announce the publication of a new information circular, "Production Comes from People," which has just been issued. This circular gives an up-to-date account of the Foundation's aims and activities.

'Industrial Hygiene, applied by experienced specialists, is a tool of economy; it is not a fancy frill. It is an economy because it helps maintain a healthy working force at maximum physical and mental efficiency. Without such efficiency, how can we have maximum production? Where health hazards exist we usually find that costly products, like solvents, are needlessly wasted. Where there is too much dust or fume for a man, whether it be a hazard or a nuisance, there is probably too much dust or fume for the good of the machinery and the products. We recently saw an interesting new process in the development stage. The success of that development, which would save huge sums of money, hinges largely upon the control of smoke. Welders have been shown to increase their output after Welders have been known to increase their output after the installation of fume control.

'A reduction in labor productivity has been alleged since the war. If that is true, how much of it may be traceable to working conditions? That introduces the human phase of the subject and the benefits to management from this source are wholly beyond the economies resulting from intelligent industrial hygiene.

'In strike votes in some organizations during the past year workers in plants with good physical working conditions were less prone to favor walkouts.

'People produce—not machines. Increased production, more goods, that is the need of the hour. Therefore, attention to people is the key. And yet management, which has developed proven procedures for dealing with virtually all of its problems, has yet to find the formula for dealing successfully with its human resources, with the worker who is the mainspring of production. We submit that industrial health, the well-being of people at work, affords one of the keys to unlock the potentialities of production and also offers a direct approach to greater harmony between employer and employee!'

ADMIRAL BEN MOREEL, formerly Federal Coal Mines Administrator; President of the Turner Construction Company, gave the keynote address entitled "Production Comes from People."

'It appears that, with almost precipitate abruptness, we have come to the realization that America is a place intended for people to live in—and that if we are to preserve our American traditions and our way of life we must do more than render lip service to the development of the power and dignity of the *individual* as opposed to the collectivist concept of treating humanity in the mass. We must recognize that the individual American citizen is engaged in a battle for survival in a collectivist world and, if he is to win, he must have the help of those who have faith in our American institutions.

'The theme of this 1946 meeting of the Industrial Hygiene Foundation has been announced as "Production Comes from People"—I would suggest an extension of this theme that "Production Comes from People and is for the Benefit of People." My thesis is that production to be truly effective, must render a service, and that an essential characteristic of that service is that production must be accomplished under conditions which *serve the public interest.*

'We can, I believe, learn worthwhile lessons from our experiences of the recent past. There is no doubt that our people can, and have, accomplished practical miracles in a material way. I believe that we can say, with all fairness, that we have not shown equal abilities in matters of basic economic policy, nor in problems which involve human relationships at home or abroad.

'During the past six years of substantial industrial profits there has been little evident need for disturbing our economic complacency with thoughts of future difficulties. Such discomforts as we experienced were eliminated, usually with government assistance, and there were no apparent detrimental effects. We became accustomed to looking to government to prevent any appreciable annoyance to our enjoyment of life.

'But times are changing; there are unpleasant rumblings which arouse suspicions in the wary that the foundations upon which we have erected this pleasing edifice of ever-expanding prosperity are not too stable; that the narcotic effect of increasing reliance on government to relieve us of inconvenience may have gotten beyond control. Thoughtful men are beginning to search their minds and souls for an industrial philosophy which is in consonance with our American social and economic aspirations.

'Perhaps the most significant guides to future conduct can be culled from our experiences during the recent great national crisis which we have successfully weathered. A review of our accomplishments during that period and a calm appraisal of the lessons of the war leads to the conclusion that the preponderant influence of the great material superiority which was brought to bear upon the enemy was the vital factor in our victory. We have become so accustomed to unbelievable production records in this country that the establishment of a new high mark hardly results in a ripple on the surface of our daily lives, but the contribution of American industry to our success in war has been so outstanding that we can well take encouragement from that record in our current efforts to advance our economic and social well-being to higher ground.

'Today our country is faced with two major problems, one external and one internal. Our external problem is the making of world peace. Our internal problem is the making of industrial peace. I believe that if we can achieve industrial peace and thus present to the world a solid front of social solidarity and industrial power, the achievement of world peace will be accelerated and facilitated.

'How can we achieve this solidarity in our citizenry which is essential if we are to obtain maximum production for maximum service to the community, and, collaterally, maximum security for our American ideals and traditions? In the past we have, I believe, been too ready to approach problems of human relationships from the sociological viewpoint only. Our recent experiences have demonstrated the hard reality that human relationships are an important element in the establishment on firm foundations of our political, economic and social structures. Stark necessity has taught us that we cannot divorce a consideration of the conditions under which people live and work and *the things they are thinking about* from the efficiency of their productivity and the stability of their service. Nor can we hope to achieve the sound organization of our citizenry which will make for optimum equity of distribution of the products of agriculture and industry unless we can eliminate the frictions and animosities which have been so evident in our recent industrial disputes.

'Labor relations are such a complicated, highly involved subject that there can obviously be no simple solution. This applies to any subject that is heavily charged with emotional influences. The big question is how can we protect our democratic principles, including freedom from domination by obstructive or oppressive laws, and at the same time, protect the public interest. Most of us believe in true collective bargaining, but we also believe that collective bargaining must not culminate in action by a few individuals which will do irreparable injury to a large number of helpless people who are not directly involved in the controversy. This is especially pertinent when the harmful action is dictated by some official, or group of

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officials, who have no local community interest and who sometimes act with the indifference of the traditional absentee landlord.

'My recent experiences have brought home to me the appalling waste of industrial strikes from which no one benefits. Not only do we have the loss of production and the impairment of our economic machinery, but the most important detrimental effect is the accumulated bitterness and antagonism between management and labor, who should be *partners* in industry, not opponents, but whose actions on both sides frequently take on all the characteristics of the class warfare of stratified societies, a warfare from which our country has heretofore been largely free.

'There is no easy road to success in labor relations, nor can the accumulated grievances and historic inequities of an industry be eliminated in a day. The establishment of confidence is the first requisite, and, in my opinion, this can be achieved only by informing the worker, and his properly elected representatives, concerning the status of the business. I do not mean to imply that the worker should participate in management, nor do I believe that the worker desires such participation. I do feel that if the workers knew more about the condition of the business and its future prospects, it would be easier to achieve a sympathetic understanding of management's actions and decisions.

'There is, I believe, much more to industrial hygiene than safe and healthful working conditions. Man is a living, creating organism. He is an individual. He is more than the sum of his parts and must be understood as a whole or not at all. The war has taught us many things about the effects on mental conditions of surroundings and treatment, effects which are reflected in production and in conduct in battle.

'One would think from the great advance made in the material warfare of the industrial worker that he must be a happy man. But what do we find in practice?

'Too often we find frustrated, anxious men and women, craving security, and who work only because of economic compulsion. Industrial workers know little of the real motives and intentions of their employers and consequently have a suspicious and frequently an antagonistic attitude toward management.

'One wonders why this apparently widespread suspicion and antagonism has arisen. Perhaps it can be attributed to the growth of great concentrations of industrial workers where, in contrast to the days when most people lived and worked in relatively small groups, we must now of necessity completely separate their working and social lives. A large part of their lives is spent in the earning of a living and during this time they, in effect, cease to be human beings and are cogs in a machine. We thus destroy a substantial value which could be turned into a valuable asset.

'That we have failed to understand this condition or, if we understood it, have failed properly to appraise its importance, is evident from the appalling waste of economic and social resources which has resulted from the widespread strikes since V-J Day. I believe that by the application of the same intelligence, patience and persistence which have enabled us to rise to the heights of material development, we can eliminate this waste. We must spend more time in the study of the individual, the working and living habits and the thinking of the workers. We must develop techniques of observation and interpretation. Our executives and supervisors must be trained in these techniques as the only sure means of improving the quality of leadership and of supervision. We have, I believe, failed to give sufficient weight to the fact that our workers have reached a high plane of intelligence. They are capable of absorbing explanations of management's plans and current operations, and we must have confidence in their ability to do so.

'One values most the thing for which he has to work hardest and, even if mistakes are made, the harm is lessened if the individual, himself, has contributed to that mistake. I recall during the military occupation of the Republic of Haiti, in which I participated, I once discussed with an eminent Haitian engineer, the great benefits which the American forces were bestowing upon his country in the way of improved public works, roads, irrigation works, water works, sanitary facilities, habor improvement, communication, drainage, schools, churches, etc. I asked him whether the Haitian people fully appreciated what was being done for them with such great effort by the Americans. His reply was very significant. He stated: "We do appreciate it, but there is no substitute for the supreme pleasure of making one's own mistakes."

'I have not intended by the foregoing to imply that only spiritual or social values need be considered in developing our plans for improved industrial hygiene. We have learned that the physical conditions under which the worker lives as well as those under which he works constitute an important factor in the efficiency of his service. Our objective should be "a sound mind in a sound body" and without healthful living conditions we cannot achieve this objective.

'We must recognize the existence of the hazard that failure of industry to accept its role as trustee of human welfare may lead to excessive political control over our economic institutions. Such control can be justified only when private enterprise has failed to discharge its obligations to the public as workers and as consumers.

'The obligation of industry weighs equally on both management and labor, who must cooperate to discharge their joint responsibility. The public is the "boss" and labor and management share this responsibility to the public welfare.

'I cannot too strongly stress my belief that any fundamental advance in our industrial efficiency depends upon a capacity to understand the individual, and to encourage his thinking and acting as an individual, to choose his leadership which will be responsible to him and to participate as a responsible individual in the formation of the policies which govern his employment. It is only by such action that we can maintain our proven American system of privately-owned, competitive enterprise, and "maximum production from people for the benefit of people."'

DR. C. O. SAPPINGTON gave a progress report, entitled "Trends in Industrial Health Administrative Practices," being a partial summary of the results of a two-year field survey supported by the Foundation, on the subject "Industrial Health Department Functions and Relationships."

The data from 278 industrial groups of various sizes, involving many types of manufacturing and service in 33 different states, and including a population of 1,180,551 employees, showed the following results:

1. Approximately 70% of all organizations did preplacement and periodic physical examinations of workers and also examinations on return to work after injury or illness; the smallest of the plants had a very good record in this respect, as did the largest, although there were considerable variations in the other sized organizations. Exit examinations at termination of employment were done in relatively few instances, except in the largest of the plants.

2. A dispensary service was provided in approximately 60% of all groups, varying from 47% in the smallest to 94% in the largest ones.

3. Slightly over half of the establishments rendered some type of industrial hygiene service, running as high as 88% in the largest organizations. Safety and sanitation services were provided for in approximately 65% of the concerns; here the smallest and the largest plants showing the highest percentages of services provided. Dental services were provided in very few instances and were limited almost entirely to emergency and prophylaxis service outside of the plants, while there were examples of part-time and full-time dentists in almost all classifications. Instruction in health and safety was given in less than half of the groups on the average with slight variations in the different classifications.

4. With respect to intramural relationships, the health department reported directly to top management in approximately 36% of all groups; the three divisions of health, safety and personnel relations were on a par ad-

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C. O. Sappington, M.D., presenting findings from a field survey on "Trends in Industrial Health Administrative Practices." Dr. Sappington is conducting his study on a grant from Industrial Hygiene Foundation

Dr. Leslie Silverman, of the Harvard School of Public Health, demonstrates his recent development, the pneumotachograph to Mrs. Gladys Ryser. The instrument measures instantaneous rate of breathing

Admiral Ben Moreell, speaking on "Production Comes From People"

ministratively in approximately 40% of all groups; and the health department had the final word with respect to health problems in approximately 43% of all groups.

5. As to records and reports, individual health records were kept in the medical department and available only to the medical staff in approximately one-third of all organizations, with variations from 16% in the small plants to 88% in the largest; examination information was given to individual employees routinely for all groups in about 31% of instances and in about 20% of instances on request only. Industrial hygiene information was given to individual employees mainly on request only on an average of 22% and in very few instances routinely. Regular reports were made by the industrial health departments in slightly over half of all organizations, as an average, running up to 91% in the largest plants.

6. Coct figures varied greatly even in the plants of a large corporation with fairly good centralized control. These variations were due mostly to differences in the arrangement and number of the rooms used and original equipment, as well as personnel. It was possible to show an array of figures concerning small plant costs in a group of 12 small plants in 12 widely scattered states. There was also considerable variation here which was due mainly to the type of housing and equipment originally provided and also with respect to variations in personnel.

7. Finally with reference to costs of service, there are certain fundamentals and basic principles which can be set forth as follows:

(A) The original investment for a small plant industrial health department usually will run from $500 to $3000, the upkeep from $300 to $700 a month; for medium sized plants from $5000 to $10,000 original investment and upkeep of $1000 to $3000 a month; for a large plant, from $10,000 to $125,000 original investment and upkeep from $2000 to $8000 a month.

(B) The small plants can do and have done very fine programs in industrial health work without the cost being what is termed excessive.

(C) Per capita cost of industrial health work will run somewhere between $10.00 and $14.00 annually in most plants.

Greater confidence and mutual respect are apparently needed between medicine and management to accomplish the utmost in industrial health programs. We have encountered instances in which management seemed fearful of delegating responsibility to the medical staff and also, the reverse has been true. It would seem advantageous that physicians should learn more about health administration in industry; perhaps the less interference with the technical functions of the health department, the better it could be administered—and still management could continue to be well informed about health activities.

The pattern of industrial health activities as observed in this study was exceedingly variable because of differences in the health program needs of various groups. There are, however, certain fundamentals common to all groups which will be discussed in the final report. It is obvious that optimum programs can only be tailored to fit each establishment, after adequate study of the group, materials, processes, equipment, and products.

The amount of time devoted to the acquiring of first hand knowledge of processes and materials by physicians and nurses remains comparatively low, even in concerns of good size.

Much has been said about the defects of the service in small plants—while it is true that many of them did not have adequate facilities, there were some which did have outstanding programs; and what seems more interesting, it was apparent that considerable improvement could be made in some of the medium sized and large groups.

MR. THEODORE F. HATCH presented "Findings from Foundation Plant and Laboratory Researches," which included his work and that of DR. F. R. HOLDEN and MR. W. C. L. HEMEON.

'A total of 51 separate plant investigations have been conducted thus far in 1946, involving the collection and analysis of approximately 2500 samples, including over 1200 dust determinations and studies of dust composition. Greatest emphasis has been placed on the dust-producing industries during the year, but a variety of chemical operations have also been studied, as in the past.

1. *'Value of Industry Wide Studies.* Attention is called to the fact that during 1946 the 10 projects in dust-producing industries included studies in 35 separate plants. Five of these projects were isolated studies involving single plants; the other five, including 28 plants, were multiple studies set up on an industry-wide basis or as over-all investigations for companies with several different plants. These studies were deliberately designed to bring together for critical study the experiences of as many plants as possible having common problems. Outstanding among the advantages of these industry-wide studies has been the demonstration that sound solutions of most problems are generally found in the industry—not all in one plant, necessarily, but within the total experience.

'The "dangerous trades" of our fathers have all but disappeared. Modern industry demonstrates every day that potentially toxic substances can be and are being used without hazard. In general, one may say that there

are more workers, by far, handling such materials safely than not. The problem today is largely one of discovering the effective control measures in actual use and making them available to the whole industry.

'The concept of study on an industry-wide basis is entirely in accord with the primary purpose of the Foundation, and, moreover, is of particular value in that it makes the day-to-day work of the organization more valuable to the members than would be possible through independent studies alone.

2. *'Value of Quantitative Studies.* Industrial hygiene is, above all, a practical field and there is no place in it for elaborate testing procedures and methods of analysis unless they aid materially in the solution of practical problems. Field experience during this year, as in the past, has demonstrated that systematic, quantitative study is of direct value in a highly practical way. For example, it was our privilege during the year to investigate a large plant in which records of dustiness and medical records extended back for a period of 20 years. These data combined with our own investigation made it possible to provide fairly definite answers to the questions which were put to us: After this prolonged period of systematic effort to eliminate the hazard, how good is the present control; and, if further improvement is needed, how can our efforts be expended most effectively? The experience of the company is outstanding proof of the practical value of quantitative study. In fact, this company was so far ahead of the parade that when they started a systematic program of dust control, its scope was seriously limited by the lack of adequate dust counting instruments and techniques. That was 25 years ago. In fact, the early phase of their dust control program was limited in scope by the lack of adequate dust-measuring instruments at the time.

'Still another illustration comes from a study of heat exposure, in which fundamental analysis revealed that the major heat source was radiation rather than simple air temperature. From this it was evident that ventilation, the common method of control, was not the method of choice and would produce relatively liitle benefit from the money expended.

'One of the most valuable items in the year's experiences was a request to investigate a new process while still in the pilot stage and to determine the probable control requirements for the final manufacturing operation so that proper plans could be made in advance. This represents the highest appreciation of the value of quantitative analysis and is a procedure highly to be recommended.

3. *'Design of Ventilating Systems and other Control Measures.* Analyses of industrial ventilation systems and other control measures during the year have shown, as in the past, that full advantage is not being taken of all of the basic engineering knowledge which is available to assist in the design of control measures. It is particularly disturbing to find inadequate performance after the expenditure of considerable money. Thus, in a comparative study of two plants doing the same work we found the poorer results in the plant having the more expensive system of ventilation and using the higher rates of ventilation.

'Plant engineers will undoubtedly agree, that the design of control equipment generally takes a secondary place in the engineering organization and they frequently complain that not enough time or money is appropriated for basic engineering analysis. Thus, they are forced to resort to empirical design data, which too often, results in inadequate performance. Too much money and effort are being spent by industry to improve working conditions wthout securing the desired results. The solution lies in fuller utilization of existing engineering data and the systematic development of additional basic information. In our experience, such an approach pays for itself. It is the function of the Foundation to assist in this development.

4. *'Appraisal of Dust Hazards and of Dust Control Measures.* It is of great practical significance that dust continues to occupy the major place in the entire array of industrial problems with which we are concerned. The dust studies have taken us into many industries in which

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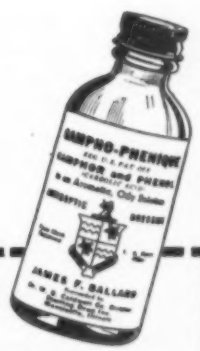

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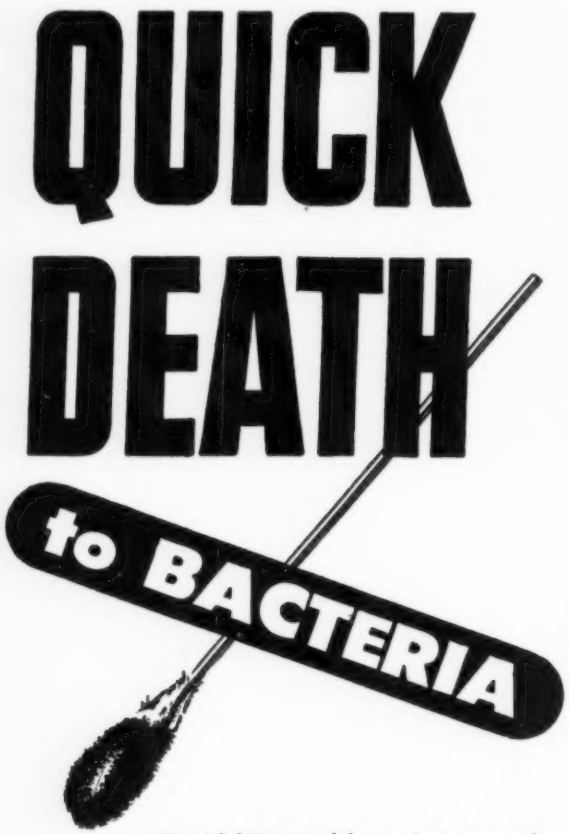

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systematic correlations between incidence of lung damage and nature and magnitude of exposure have not been made. Thus, it has been necessary to draw heavily upon the experiences gained in a few industries for which such correlations exist in order to make the best possible appraisal of each new situation. In reviewing this work, one is impressed with the need for much more extensive information than we now possess. Some progress has been made in refining techniques through improvements in the determination of dust composition. The new procedure, reported at the 10th annual meeting, has continued to give interesting and valuable data. Other improvements in appraisal methods are currently being investigated.

'We are impressed with the significant difference between the silicosis problem in industry and the far more general nuisance dust problem. It is necessary to distinguish between them since, more often than not, the nuisance dust is the more spectacular and is likely, therefore, to receive more attention.'

DR. A. J. LANZA paid a beautiful tribute to the late LEROY U. GARDNER, M.D., which is to be reproduced in full text in the proceedings of the Foundation.

The summary of the medical and engineering conferences by DR. C. RICHARD WALMER and PROF. PHILIP DRINKER will also be published in full text in the proceedings of the Foundation.

Afternoon Session, November 7

MR. R. H. PASS spoke on "Management's Opportunity to Advance Occupational Health."

'Recently in one of the publications of this Foundation I saw a statement to the effect that industrial hygiene pays off, and when I read that I thought back over the 30 years or so I have been in business to see whether our experience would contribute to the answer as to whether that contention is valid.

'The Onondaga Pottery Company manufactures chinaware, that is the tableware on which food is served in hotels and restaurants, public eating places generally, and also in the home. It has two plants, an old plant the first unit of which was constructed in 1880 and is still in use, and a new plant, a one-story structure which is laid out about as well as a pottery could be and was intended to be, and I believe is, nearly ideal from the standpoint of hygiene within a pottery. I mention that because we were faced with the two types of problems, the problems involved in an old plant, and the problems involved in a modern plant.

'Pass & Seymour manufacture electrical supplies, specifically wiring devices as they are called, switches, sockets, convenience outlets, devices of that type with which we all are familiar in our homes. As an insulating material in those wiring devices porcelain is used, less so now than it used to be, but even today the manufacture of electrical porcelain is a substantial part of the operations at Pass Seymour.

'In the old days the potteries had a reputation of being unhealthy places in which to work. That reputation goes back for generations. The old potters called the disease which they contracted in the potteries "potters' rot." Later it was known as 'consumption." Today we know that actually it is acute tuberculosis superimposed on silicosis.

'When I first came to the pottery I used to talk over the traditions with some of the oldtimers. The potters generally were a hard drinking crowd and I would discuss that with them and try to dissuade them, but they assured me that there was a good reason for it; they said that it was necessary for them to consume strong liquor in order to dissolve the dust from their insides. And I have always suspected in that regard that probably the wish was father to the thought.

'When I came to the pottery in 1915 and started working in the shop, the lead poisoning problem had already been solved. That was done about 1900 by what potters know as "fritting" the lead; that is to say, in the glaze preparation the lead was mixed with silica, sand, clay, with other materials, and was then fired to a hgh temperature, producing a glass or fritt, as it is called. The fritt is then crushed and ground and mixed with other

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glaze ingredients, so that the glaze when it goes to the dipper has no free lead in it. The composition of that fritt, lead fritt, is such that it is not readily soluble in the body fluids.

'We still had the problem of protection during the preparation of the fritt, but by modern methods and proper exhaust systems we have eliminated that problem also. There has been no case of lead poisoning contracted in glaze dipping in the last 30 years, and there have been no cases contracted in any of our operations, including our lithograph department, in 20 years.

'Similarly, by the time I got to the pottery the danger of silicosis from bedding the ware had been eliminated. It was eliminated some 40 years ago by the expedient of using an especially prepared clay for bedding the ware, instead of the flint or silica which had been used previously, and we have had no case of silicosis arising from those operations since that time.

'But in the clay shops where the ware was formed by the methods (described) there still remained enough dust to be noticeable. That was true also in the body preparation rooms, where the body was compounded. I had had first-hand knowledge of the ravages of silicosis and the acute suffering which it can cause, and I made up my mind that there must be some way of overcoming that hazard in the pottery industry, and that that way must be and would be found.

'The first thing we did was to undertake very careful housekeeping. That was difficult because at first we couldn't get the cooperation of the workmen, but gradually we succeeded in making them unpleasantly conscious of dust, so that they cooperated with us in trying to eliminate it. We spent a lot of time and money keeping those shops as near immaculately clean as we could.

'By 1925 we had reached the point where we could not see any dust in the air, but I didn't know, and we had no way of telling, whether there was sufficient invisible dust to create a hazard. In that year the Millbank Foundation was running a public health experiment in Syracuse and DR. C.-E. A. WINSLOW, of Yale, was in Syracuse in that connection. I asked him to come out and explained the problem to him. He said there were two young men in Washington, one in the Surgeon-General's office, who had recently developed an apparatus for sampling dust in the atmosphere, known as the Smith-Greenburg impinger. So I wrote Surgeon-General Cumming and DR. GREENBURG was sent up to the factory and brought his impinger with him. We made a duplicate of it which we have used ever since.

'We found great difficulty in getting consistent results; one test would be high, another test would be low, and the results were so erratic that it was difficult to interpret them. Consequently we took a section of the shop and boarded it off and put all of the operations in that section, kept the jobs filled, kept the windows closed, put in our impinger, and succeeded in getting consistent results. Then we undertook step by step to make changes to find out what was causing the dust and how it could be controlled, and eventually we succeeded in reaching our goal, which was to get the dust down to 100 particles per cubic centimeter.

'Why that figure? Up to that time not much work had been done in evaluating the hazard of dust concentrations. The work I was familiar with, I think the most authoritative up to then had been done by Kotze and Mavrogordato in South Africa, working for the Royal Phthisis Commission, and they had found that concentrations in the neighborhood of 100 in a cubic cm. were harmless. Down there they were working with dust very high in silica, much higher than 35%, but I had a double problem which was this: I had to protect not only the new people coming into the shop from acquiring silicosis but I also had to protect the older men who had been in the plant for many years and some of whom had acquired more or less silicosis. It was important to them to see to it that that silicosis did not progress. And so we took 100 p./cc. as standard.

'We followed that program at the pottery intensively until 1930. It is much too involved to outline here. By that time we had the problem pretty thoroughly licked

An annual meeting group, left to right: L. J. Bowker, Mine Safety Appliances; I. S. Pascal and Dr. E. V. McCormick, Carnegie-Illinois Steel; H. B. Duffus, Westinghouse Electric; R. E. Tugman, Imperial Chemical Industries of London; and William H. Chestnut, Secretary of Labor and Industry, Commonwealth of Pennsylvania

as judged by any known standards of dust hazard. Since that time I have been too busy to give sufficient time to it but others followed through until 1941, after which time we were so pressed by work for Army Ordnance that we couldn't follow it. I knew from personal observation that conditions had somewhat deteriorated, and asked the Industrial Hygiene Foundation to come and make a study, as MR. MCMAHON has stated.

'I asked the question: Have we reached a point where there is no longer any hazard, either to new employees or old employees? If not, where is there a possible hazard remaining and what do you suggest for correcting it?

'Fortunately we were able to correlate the dust studies with x-ray findings, because we have been taking x-ray pictures for many years. So we had the x-rays; we had our own dust analyses over this extended period, plus this recent survey by the Industrial Hygiene Foundation just completed. The most helpful x-rays were a group taken in 1935, when we x-rayed everybody in the pottery who had worked five years or more in a department which used to be hazardous. In 1944, nine years later, 106 of those people were still with us and were still working in the same locations, doing the same job or substantially the same job. So we re-x-rayed them and had the pictures of 1935 and of 1944 for comparison, and we correlated them with dust counts, those that we had taken before and the counts that the Industrial Hygiene Foundation made, and we got the answers.

'Now as to the payoff: When we started this work in 1925 there was no suggestion that silicosis be made compensable as an industrial accident under the workmen's compensation law. But by the early 30's that was being agitated, and about 10 years ago a New York State law was passed making silicosis compensable. Immediately the insurance rating board, which sets rates for industries, applied an enormous premium to pottery workers. We contested it, and we wound up with a premium one-fifth of what had been proposed, and of course it turned out that the saving in dollars was very significant.

'Furthermore, we have had no compensation cases. In other words, there have been no cases of men rendered incapacitated by silicosis. There is statistically one exception to that, but it is a man who did not acquire silicosis in our plant. And that also has been a very substantial saving to the company.

'There is another saving, intangible but no less important.

'Potteries had a reputation of being unhealthy in the old days and it was very difficult sometimes to get promising young men to work in those departments where the dust hazard was. Especially the fathers and grandfathers who worked there did not want their children and grand-

children coming in. Now that has been totally eliminated and there is no longer any resistance on the part of young people to coming in and working in those departments.

'So if we take the balance sheet and look at it, there is no question at all but that in dollars and cents the company has saved far more than the expense and efforts we went to to eliminate the silicosis hazard in our plants.

'But there is a more fundamental and basic factor than that. It is employee relations. I speak of it here because I am sure we all realize that industrial hygiene is fundamental to sound employee relations. Here again I am going to give you the facts and let you judge for yourselves, rather than asking you to base your judgment on my opinion. In our three plants there are now 2200 people employed. For over a quarter of a century there has never been a falling out between any group of workers in any of those plants and management, and in that period of over a quarter of a century not one hour of production lost due to such causes. In these days I think most of us realize what that means financially.

'Furthermore, whereas we are hearing of greatly decreased productivity per man-hour in so many plants, there has been no serious reduction in productivity per man-hour in these plants which I have mentioned. In fact, in one of them the productivity per man-hour has gone markedly up since 1941. And we in management know well what that means from the standpoint of the balance sheet.

'There is another important factor. The work we have done in this last quarter of a century or more has resulted in preserving to us many of the older workmen who would not be here today were it not for these precautionary measures. We need the skills of these older men; we need their production; and, furthermore, we need them because they have a most helpful in fluence on the young people coming into the organization. There have been efforts from the outside in recent years to drive a wedge of distrust and misunderstanding between the workmen and management. They have not succeeded. And one of the reasons they have a most helpful influence on the young people who have been with us so long, and who have had a good influence in keeping the younger ones from going astray.

'I am sure we all agree that good employee relations are dependent on the service rendered to the people working in the organization, using "service" n the broader sense. The nature, extent and quality of that service are the determining factors in the human relations within industry, and certainly protecting the health of the workers is an essential part of such service.

'Now I have given you briefly a record of 25 years and I think you can judge for yourself whether that bears evidence as to the validity of the contention of the Industrial Hygiene Foundation that industrial hygiene pays off. As far as I am concerned, I am convinced that good human relations in industry, of which industrial hygiene is an essential part, are not only right from the standpoint of human values but are equally right from the standpoint of sound business economics.'

DR. ANNA M. BAETJER discussed "Respiratory Ills and Their Control in Industry—with special reference to influenza immunization."

'Absenteeism due to respiratory infections. Acute respiratory diseases are by far the most important cause of sick-absenteeism in industrial workers. They are responsible for almost 40% of all the time lost due to sickness and for 60% of all cases of illness causing one day or more absence. Although the figures are from only one company and although some of this illness is probably incorrectly reported, there is good reason to believe that these data give a fairly accurate picture of the respiratory disease problem in industry. If the figures published for this company are approximately correct for the working population as a whole, then men lose on an average of 3-4 days annually and women 4-5 days from respiratory diseases alone. During the first seven months of 1946, there were about 38 million men and 16 million women gainfully employed in the United States.

'If we calculate the total number of days lost due to respiratory illness on the above basis, we come to the

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Andrew Fletcher Executive Vice-President, St. Joseph Lead Company and Chairman of the Board of Industrial Hygiene Foundation, and John F. McMahon, the Foundation's Managing Director, look over a Pittsburgh Plate Glass exhibit

appalling conclusion that the working people in this country lose about 182,000,000 days per year from non-tuberculous respiratory infections. Assuming an average way of $5.00 per day, this represents a loss of almost one billion dollars in wages alone. To this must be added the cost of medical care, drugs, etc. Among the various types of respiratory diseases the common cold ranks first in importance, accounting for almost half of the respiratory disease cases and one-fourth of the resulting time lost.

'Calculated on the same basis as used above, the common cold causes about one day of lost time per person per year and leads to a total loss of 57,400,000 days per year and $287,000,000 in wages. The cost to employers is not so easily estimated but it is evident that an annual absenteeism rate of 182,000,000 man days must involve a tremendous financial loss. DR. A. J. LANZA (Metropolitan Life Insurance Company) estimated in 1941 that the acute respiratory infections cost employers at least $400,000,000 annually. In addition to the effect of this absenteeism on production, there must be a decrease in efficiency of these people during the onset and recovery from such illnesses and of those people who are not sufficiently ill to stay away from work.

'Respiratory illnesses, because they are numerous and of short duration, interfere more with production than do conditions which cause fewer cases of longer duration. Over half of the respiratory disease cases last only three days or less and 90% last one week or less.

'The problem of respiratory diseases in industry is even more acute when one considers that the greater part of this absenteeism falls within a period of five months. However, the increased frequency of respiratory diseases in the winter months is so regular that industry can, at least, plan on this advance. Not only is there a marked seasonal variation in respiratory diseases but also the incidence varies greatly from year to year depending on the occurrence of epidemics. Unlike the seasonal rise, industry cannot predict the years in which epidemics will occur and consequently cannot be prepared for these.

'The distribution of respiratory diseases varies somewhat with the age and sex of the workers. Women have a higher rate of acute respiratory diseases except pneumonia and possibly influenza than do men, the excess being especially marked in colds and tonsillitis. In general younger workers have respiratory diseases more frequently than older people but their illnesses are of shorter duration. Colds and tonsillitis seem to be more prevalent in young people whereas the more serious types such as bronchitis and pneumonia are more frequent at older ages.

'*Methods for controlling the transmission of respiratory infections from one worker to another are* (a) droplet control; (b) dust-suppressive measures, and (c) air disinfection for control of droplet nuclei.

'*Methods for controlling the susceptibility of people to respiratory infections.*

(A) Personal preventive measures:

1. Immunization:

(a) Vaccination. The recent work on influenza A and B has given great hope that respiratory infections may be controlled in the near future by immunization. At the present time, however, such measures are only available for influenza A and B and certain types of pneumonia. Although certain individuals appear to benefit from some types of nonspecific vaccines sold for protection against respiratory infections there is no real evidence that any of these vaccines will protect against the common cold or any other respiratory diseases. However, in the case of influenza A and B there is now on the market a vaccine specific for these two conditions. This vaccine has been tested extensively by the Army and the results have proved most successful. Although the vaccine did not protect all people to whom it was administered, the average reduction in the incidence of influenza diagnosed on the basis of clinical symptoms was about 60% in all the Army groups taken together, the variations being from 9-88% in the different groups tested. Even when only those cases proved to be serologically positive for influenza were included, it was found that all persons who were vaccinated were not protected. The immunity developed within one week to 10 days after vaccination. The duration of the immunity has not been determined as yet.

Vaccination of persons who are sensitive to egg is contra-indicated since serious allergic reactions and even death may occur.

(b) Passive immunization.

2. Prophylactic use of drugs (chemoprophylaxis).

3. Ultra-violet radiation.

4. Nutrition.

(B) Environmental control measures:

1. Exposure to temperature and humidity and inclement weather.

2. Exposure to industrial dusts and gases.

(C) Administrative procedures.'

DR. RALPH S. MCLAUGHLIN gave a report on "Recent Research on Chemical Injuries to the Eye."

'The development of this technique has extended over a period of seven years, the study being undertaken because of dissatisfaction of results obtained by the methods currently used. Review of the literature does not reveal any concerted study of this subject. I am always much impressed by the tending of such articles as are published, for they give an extensive discussion of the complications and their treatment. I believe I can state fairly that treatment of complications of chemical burns is at the best, make-shift and almost routinely unsatisfactory.

'Vascularized scar tissue and conjunctival adhesions are still in the category of medical conditions not amenable to treatment. I believe you are all familiar with the economic upset to employee and employer entailed by this now unnecessary failure of treatment.

'As has been stated, we consider a chemical burn as an injury which results from local contact with a chemical (solid, liquid, or vapor) to such a degree that there is alteration in the structure of the cornea and/or conjunctiva. The key to this alteration is a positive stain after application of 2% buffered fluorescein solution. All contacts showing stain after the completion of thet first aid technique are considered serious and are to be referred to the consulting ophthalmologist for treatment. The time element is of importance since results become more uncertain as time increases. Less than two hours is excellent, under six hours is good but a little uncertain, over six hours is unforgiveable. Some employers still feel that such reference of injuries is extravagant and hold cases "to see if it is really necessary."

'By means of employee education immediate treatment of an eye burn is encouraged. This consists of a thorough eye washing at an eye fountain or other source of tap water, the lids being held open with the hands. No neutralizing substances are to be used. After this washing the patient is to be sent at once to the medical dispensary

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where complete equipment for first aid is maintained. The eye is anesthetized and stained. If a positive stain is found, a constant washing of the eye is started and carried on for a period of 15 minutes. Gross particles are watched for and removed and careful attention is paid to the folds of the conjunctiva. After the first 15 minutes, stain is again applied and if negative the case is placed under observation at two hour intervals for four hours. If positive, another 15 minute washing is carried out. Stain is again applied and this time if positive, the contact is considered to be serious and the case is referred without delay to the ophthalmologist for special care. All first aid stations should be provided with a list of chemicals used and their severity of injury expected.

'The specialized treatment of burns of the eye we have termed "denuding." When the injury arrives at the office the eye is at once restained with fluorescein and studied under the high power of the bio-microscope. The cornea presents a typical appearance in all cases of alkaline and injurious neutral compounds, a number of distinct opacities resembling deposits of grayish-colored material in the superficial layers of the corneal epithelium. These have been found by the group of DR. HENRY F. SMYTH, JR., Mellon Institute, to be actual collections of the offending chemical and offer the solution to the proper treatment of the condition. It has long been noted that certain chemicals had a socalled "delayed action," and this we now believe is caused only by the lapse of time necessary for the chemical to progress through the corneal epithelial layers to the vital Bowman's membrane. It is to be noted that acid burns do not present this typical corneal appearance, but we have found by experience that such burns heal more rapidly if the denuding is carried out.

'The denuding technique in its early application consisted of complete removal down to Bowman's membrane. That picture is described in the complete roport. Now we have found that it is only necessary to remove such cells as have already been involved by the chemical and such selection can readily be done by repeated checking on the bio-microscope as the removal progresses. Under cocaine anesthesia, using a toothpick swab, the epithelium is carefully wiped from its attachments, trying to take only a minimum thickness of the structure at a time. This is accomplished by starting in the center of the cornea with just enough pressure to distort slightly the corneal surface. With a circular motion the applicator is carried progressively from the center to the outside area, where it is lifted. This action is repeated until the bio-microscope reveals no more clouded cells, leaving only the roughened surface indicative of ruptured cell bodies and cell fragments. When the denuding of the cornea is complete, the conjunctiva is carefully denuded—but control here is not possible since the microscope is not sufficiently powerful to lend help. It is best to over-do both on the cornea and the conjunctiva but more important on the conjunctiva due to the lack of control.

'The physical condition of the employee is important in that existing areas of focal infection may convert the freshly denuded areas into infected ulcers. We have had many of these and nearly all failures in our series have had such complicating factors. Prompt recognition of focal infection and its associated complicating infection on the eye is of some protection, but employment and annual physical examinations with necessary treatment before injury is certainly a goal for which we should all strive. In my office, if a case has not healed in 24 hours, a suspicion of complication is established, and certainly 48 hours confirms such fears, and demands active combative treatment.

We do not hesitate to remove infected teeth or tonsils at any time and in some cases have found that ulcers which would not heal, had healed overnight when the source of infection had been removed.

'The after care of these burns is of great importance and meticulous attention to detail will be amply rewarded. The individual must be provided with relief from the extreme pain which follows denuding. For this, ½% pontocain ointment has been our best agent so far. The medication may be used as often as necessary to keep down pain without fear of damage to the eye'

A guest examining a new lead analyzer which was displayed in the exhibits. This instrument has been developed by The Ethyl Corporation

MR. THEODORE C. WATERS discussed the subject "Legal Developments Respecting Occupational Health."

I. *'Occupational Disease Compensation Statutes Enacted or Amended during the year 1946.*

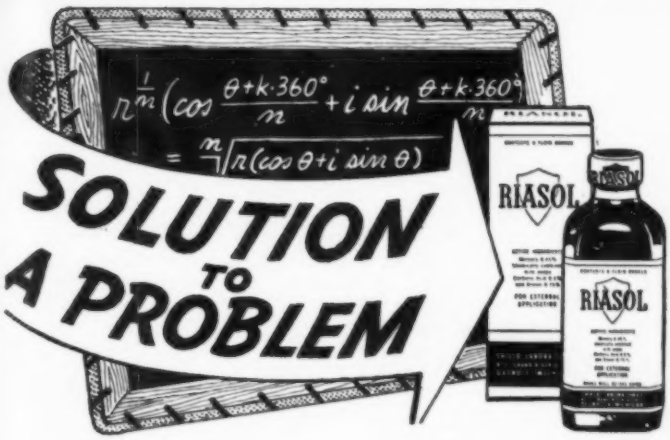
(A) *New Occupational Disease Compensation Laws.* Georgia has enacted an occupational disease compensation law which became effective April 30, 1946. This act made compensable a scheduled list of diseases caused by exposure to 22 named chemical poisonings, diseases caused by exposure to x-ray or radio-active substances, and the diseases of asbestosis and silicosis.

(B) *Amendments to State Workmen's Compensation Acts.* New York State amended its compensation act to increase the maximum aggregate compensation payable for total disability or death due to silicosis from $6,500 to $7,500. The act contains the escalator clause increasing the total amount of compensation payable for disablement or death at the rate of $50.00 per month.

(C) *Summary of States Wherein Occupational Diseases are Compensable.* There are now 16 states (Calif., Conn., Florida, Ill., Ind., Mass., Mich., Minn., Missouri, New York, North Dak., Ohio, Oregon, Wash. and Wis.), the District of Columbia, Hawaii, and Federal jurisdiction wherein the Longshoremen's Act is applicable, providing general coverage for all occupational diseases. There are 17 states 17 states (Ariz., Ark., Colo., Del., Ga., Idaho, Ky., Maine, (Ariz., Ark., Colo., Del., Ga., Idaho, Ky., Maine, Maryland, New Jersey, New Mexico, North Carolina, Pa, Rhode Island, Utah, Va., and West Va.) and Puerto Rico wherein schedule coverage is provided for named occupational diseases. Therefore, in 33 states, as well as the District of Columbia, Hawaii and Puerto Rico, occupational diseases are now compensable.

Compensation is also provided by the Federal Employees' Compensation Act and the Longshoremen's and Harbor Workers' Act. Under the laws of 18 states (Ariz., Ark., Colo., Florida, Ga., Idaho, Maryland, Mass., Mich., Minn., New Jersey, New Mexico, New York, Oregon, Pa., Rhode Island, Utah, and W. Va.), compensation payable for dust diseases is limited with respect to the employer's monetary liability, and in 12 states (Colo., Florida, Idaho, Maryland, Mass., Mich., Minn., New Jersey, New York, Ohio, Pa., and Utah), compensation for the dust diseases is payable only for total disability or death.

II. *'Codes of Industrial Hygiene.* There are 35 states (Ala., Ariz., Ark., Calif., Colo., Conn., Del., Florida, Idaho, Ill., Ind., Ky., Maryland, Mass., Mich., Minn., Miss., Missouri, Nebr., Nevada, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Pa., Rhode Island, South Carolina, South Dakota, Tenn., Vermont, Va., Wash., and Wis.) that have codes of some type which are presently effective. None of these is uniform. They represent the attempt of individual state departments to promulgate rules and regulations for the control of occupa-



Any algebraic problem, no matter how complex, is easily solved by one who is familiar with the mechanisms involved. To the uninitiated, it is just a hodge-podge of symbols.

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tional hazards in a manner that seems proper to the particular state agency involved. In form, some of these codes are applicable only to specific industries, as for example, the codes in New York State. In other states, the codes are inclusive of all industry, establishing permissible concentrations of dusts, fumes, gases and vapors without specific reference to a named industry.

'I think it may be fairly stated that many of these codes, while well intentioned, were adopted without full consideration of the various problems of industry to which they would apply. In many instances they establish arbitrary standards of permissible concentrations of toxic dust, fumes and gases and say to industry, "Thou shalt not permit concentrations exceeding a stated limit." In most nstances the codes do not attempt to advise industry of the way and means to accomplish compliance. It is submitted that one of the functions of the bureaus of industrial hygiene should be to assist industry to control occupational hazards and to find the best method for compliance.

'The legal authority for codes may be found either in the constitution of the state or specific legislative provision authorizing the creation of bureaus of industrial hygiene and the grant of authority to such bureau to formulate codes, or the powers incident to the functions of state departments of health, labor, or industrial commissions. Most of the codes establish maximum allowable concentrations of toxic materials with penalty provisions for failure to comply. Enforcement s generally given to the state departments of health, labor, bureaus of mines or industrial commisions. In most instances, no specific provision is included for methods by which industry may attain compliance.

'In the administration of these codes, it would seem desirable for the administrative agency to cooperate with industry in the attempted solution of industry's problems by educational processes, rather than by police enforcement of the penalty provisions.

'It is unfortunate that there is not greater uniformity in the state codes presently effective. Under the leadership of the U. S. Public Health Service it should be possible to prepare some uniform code that would be suited to industry of all industrial states. If this were done, the codes now effective could be repealed and the proposed model code enacted. With the cooperation of employers, employees and the state agency administering the codes, occupational hazards could be reduced to a minimum and diseases practically eliminated.

III. '*Health Clauses in Union Contracts.* This subject is one of increasing importance and emphasizes the role of industrial hygiene in labor relations. Perhaps detailed discussion of the subject would be more appropriate in meetings that are devoted to a consideration of industrial relations. It is not the purpose of our Committee to recommend the inclusion or exclusion of clauses of this type and we believe it will be of interest to members to consider certain provisions that have been included in contracts which have been published and are fairly representative of the trend of clauses now being considered by departments of industrial relations.

'In the agreement, dated March 19, 1946, between General Motors Corporation and the United Automobile Workers-CIO, we find the following incorporated as paragraph 146 of that agreement:

'"A report of physical examination and any laboratory tests made by physicians acting for the corporation will be given the personal physician of the individual employee involved upon the written request of the employee."

'Again in an agreement, dated March 13, 1945, bewteen Carnegie-Illinois Steel Corporation and the United Steelworkers of America-CIO, we find Section 12, dealing with safety and health, provides as follows:

'"The company shall continue to make reasonable provisions for the safety and health of its employees at the plant during the hours of their employment. Protective devices, wearing apparel and other equipment necessary to properly protect employees from injury shall be provided by the company in accordance with the practices now prevailing in each separate plant. Proper heating and ventilating systems shall be installed where needed."

'In the agreement, dated July 6, 1945, between Industrial Silica Corporation and the United Steelworkers of America-CIO, we find the following sections under Article 14 dealing with the subject of physical examinations:

'"Section A. Conditions of Examination. It is hereby mutually understood and agreed that the corporation shall have the right, from time to time, to require employees, at its own expense, to submit to medical and physical examinations by physicians or specialists of its own choosing, and to terminate or suspend employment of any employee or transfer him to another department if such examination shows that said employee cannot with safety satisfactorily continue the kind of work he was doing at the time of such examination or is suffering from any disease which would be communicated to the other employees.

'"Section B. Effect on Employee. No such employee shall be permanently laid off, suspended or transferred as the result of any such examination until he has been given five (5) days' written notice of the intention of the corporation so to do and the records of the corporation with respect to any such examination shall be open to inspection by the employee's personal physician upon the written request of the employee."

'In certain instances, representatives of labor have made public statements in opposition to requirements by employers for pre-employment physical examinations as a prerequisite to employment. Similar opposition has been expressed with respect to recurring annual physical examinations. You will recall previous reports of our Committee pointing out statutes of various states under which in certain occupations pre-employment physical examinations were required by law, and in which annual recurring physical examinations were similar required. Certainly in those industries where potential hazards to health exist one of the most effective methods of control of the incidence of disease is the use of physical examinations to determine whether or not the claimant may be suffering from, or peculiarly susceptible to, a given occupational disease, and for his own protection and that of his fellow workmen, it is desirable that he should be excluded from such employment. Furthermore, the use of annual physical examinations in certain industries may well develop information as to the incidence of occupational diseases and protect employees against potential disability or ultimate serious illness.

'While the use of physical examinations may have been and may be, abused, they are certainly desirable for the promotion of programs of medical control. With respect to the employment of physically handicapped employees, such examinations are essential to the proper placement of these individuals so that their ability may be evaluated and they may be assigned to do those jobs where they are best fitted.

'In conclusion, during the year 1947 the legislatures of all of the States of the Union will convene except Kentucky, Louisiana, Mississippi and Virginia. It is to be anticipated that legislation relating to amendments to existing workmen's and occupational disease compensation acts will be introduced, and in many states enacted. Our Committee suggests to members that it will be to their interest to follow these legislative sessions with care to see that whatever provisions may be adopted are reasonable and suited to their industrial operations.

'The promulgation of codes by the various states will proceed and it is reasonable to expect that bureaus of industrial hygiene will increase their activities in an attempt to eliminate potential hazards and assist industry in effecting control of health conditions. Much has already been accomplished in the field of industrial hygiene. Much remains to be done. Let no member company minimize the importance of this subject and let constant care in your operations be your watchword so that industrial accidents and diseases may be kept at an absolute minimum.

MR. B. E. KUECHLE completed the program sessions, giving a discussion of "Legal and Administrative Handicaps to a Rehabilitation Program."

'At no time since industry became interested in employing handicapped persons has such a rapid progress been

Dialysis . . .

Determination of the osmotic pressure of SAL HEPATICA by dialysis demonstrates its "liquid bulk" action in the gut. Through the increase in fluid content, gentle pressure is exerted on the mucosal nerve terminii to stimulate normal peristalsis toward laxation or catharsis.

The desired action of this balanced saline can be easily controlled by the physician through proper regulation of dosage. Economical. Speedy, thorough action throughout the entire canal.

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MORE DOCTORS SMOKE CAMELS

than any other cigarette

Doctors too smoke for pleasure. Their taste recognizes and appreciates full, rich flavor and cool mildness just as yours does. And when three independent research organizations asked 113,597 doctors—What cigarette do you smoke, Doctor?—*the brand named most was Camel!*

EXPERIENCE TAUGHT MILLIONS

the Differences in Cigarette Quality

...and now the demand for Camels—always great—is greater than ever in history.

DURING the war shortage of cigarettes ... that's when your "T-Zone" was really working overtime.

That's when your Taste said, "I like this brand"... or..."That brand doesn't suit me." That's when your Throat said, "This cigarette agrees with me"...or..."That one doesn't."

That's when millions of people found that their "T-Zone" gave a happy okay to the rich, full flavor and the cool mildness of Camel's superb blend of choice tobaccos.

And today more people are asking for Camels than ever before in history. But, no matter how great the demand:

We do not tamper with Camel quality. We use only choice tobaccos, properly aged, and blended in the time-honored Camel way!

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T FOR TASTE...
T FOR THROAT...
That's your proving ground for any cigarette. See if Camels don't suit your 'T-ZONE' to a 'T'

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made in the placement of the physically and mentally handicapped as has been true since Pearl Harbor. Individuals who were considered hopelessly unemployable, even by skilled placement personnel, at last found opportunity to add their help, however, trifling, to our all-out war effort. Hosts of individuals with no hope of ever again being able to assist in supporting themselves were found to have special talents, many times made more efficient because of their handicaps, that permitted them to do specific jobs even better than normal individuals. Industry is convinced that handicapped persons, properly placed, are a real manpower asset in its broadest sense.

'With the return of our veterans and a more plentiful employment market, any menace to our position must be recognized and removed before the appreciation of the economic value of our disabled population as wage earners is lost sight of. Too many seriously disabled veterans are unemployed, and the picture will grow even darker unless all interested agencies, particularly public and governmental, will take leadership in removing such threats. Industry cannot continue to give preference to handicapped veterans, be they veterans or not, where faulty laws and faulty administration of adequate laws impose financial penalties, many times very severe, following injuries in themselves inconsequential.

'Even of greater concern is the growing tendency of ministrators to go beyond legislative intent of liberal interpretation of compensation laws and by unjustifiable decisions charge to industry the ordinary and expected consequences of disease and old age.

'The setback suffered by a well-planned and well-executed rehabilitation program in a community or state through ill-considered determination of only one compensation case may be, and frequently is, truly pathetic.

'Volume I, Number 1, page 13, of the new bulletin entitled "Workmen's Compensation Board Decisions" released by the Workmen's Compensation Board of the State of New York on June 1, 1946, contains a digest of a recent case under the caption "Blind Worker Disabled from Continuing Occupation for Which He Was Trained." The digest reads as follows: "Industrially blind worker who was trained and employed as a masseur developed a disabling dermatitis from the materials used which prevented him from continuing such work. The carrier protested awards made to him for partial disability contending that he would be able to earn wages at another occupation except for his blindness. Held, that since claimant is totally disabled from working in his own occupation and as it has not been shown that he is able to earn wages in another occupation, he is industrially totally disabled."

'The importance should be emphasized of immediate revisions of those compensation laws which force administrators to favor the individuals involved by granting awards whch menace our progress in securing employment for handicapped individuals. While there may be some question whether so-called "second injury funds" are the complete solution to overcoming such handicaps, the fact is that such funds have been given rather wide acceptance by agencies interested in rehabilitation, including employers' organizations, labor organizations, and compensation insurance carriers. Any discussion of possible disservice of second injury funds would therefore be purely academic.

'Congress and the legislatures of most states meet early in 1947. Compensation and rehabilitation administrators should recommend the immediate revision and amendment of laws that in any way handicap the broadest possible rehabilitation program. A further delay of two years until our next legislative sessions are held may do irreparable harm.

'However, an even greater handicap than defective laws and more difficult to remedy is the unconscionable administration of even adequate laws in so far as a rehabilitation program is concerned.

'It is sometimes pretty difficult to be critical of industry when in the light of such decisions, employment is refused indivduals suffering from malignant disease, heart disease, cardiovascular renal disease, and other diseases of degenerative types which always result in death without intervening causes.

'Courts of last resort in many jurisdictions, while affirming decisions of compensation boards, have decried their inability to change such decisions because questions of fact and not of law were involved. In most states, questions of fact are not reviewable. Complete disregard of scientific, logical medical evidence and the acceptance of evidence based on rank speculation, while beneficial to claimants in particular cases, can't help but be a deterrent to the enthusiastic support of industry of a more generous employment policy toward handicapped individuals.

'The only way this situation can be remedied and these handicaps removed is through an intensive educational program sponsored by rehabilitation agencies directed at administrators and their referees, examiners, and deputies who preside at compensation hearings and render the decisions.

'Ladies and gentlemen, I am blind in one eye. I should dislike to receive compensation for some future injury because of such handicaps as I have outlined when a favorable award would jeopardize the opportunities of my fellow handicapped citizens from procuring employment; neither do I wish to see other handicapped citizens receive awards under these circumstances if by so doing my opportunities for continuing employment are jeopardized.'

Personnel Practices in Fifteen Countries

"DEAR CHARLIE"—letters of comment on personnel practices in 15 countries—is written by BERT HANMAN, of Berkeley, California, personnel researcher, who is being sponsored by the Rheem Manufacturing Company to prepare a book on "The Worker and His Job" for the general good of industry, government and labor. These letters, of which this is the fourth, will appear each month for six months in INDUSTRIAL MEDICINE, *National Safety News* and *Personnel Digest* in America, as well as in several European Journals.

Geneva, December 31, 1946.

DEAR CHARLIE: December! What a month for me—Holland (Amsterdam, The Hague, Rotterdam, Utrecht and Heerlen), Belgium (Brussels), Italy (Milan), and Switzerland (Zurich and Geneva)!

In these countries I have contacted 33 important professional people concerned with industrial problems. Again, the proposed "International Conference on The Worker and His Job" (please refer to previous letters) has been discussed at great length, receiving remarkable support.

You will remember that the plan calls for delegations of 24 men from each of four major countries and for four observer delegates from each of some 20 other countries. In each of the smaller countries visited this month, a representative (secretary or contact man) has been chosen in meetings of professional men within each country. These representatives are as follows: (1) Belgium: G. Henri Francx, Engineer, Director of Personnel Research, Solvay Works, Brussels; (2) Holland: Dr. Jacob Koekebakker, Director, Department of Mental Health, Institute of Preventive Medicine, Leyden; (3) Italy: His Excellency, Agostino Gemelli, Rector and Professor of Psychology, Catholic University, Milan, and President, Papal Academy of Sciences; and (4) Switzerland: Professor R. de Valliere, Engineer, Director, Institute of Scientific Management, Federal Technical University, Zurich.

You will recall that a five-man committee has been elected in both Great Britain and Scandinavia (major countries), and now, with representatives for each of these four smaller countries, the foundation for building the proposed organization has been broadened just that much more.

Of particular significance in connection with this plan are the reactions of several gentlemen who have

had long, intensive and extensive experience with important international organizations. Each of these seasoned experts in international organization has given his personal endorsement as to both the need for and the objectives of the proposed "International Conference on The Worker and His Job": (1) Dr. Luigi Carozzi, Secretary, International Organization of Industrial Physicians and Surgeons, Geneva: (2) Professor R. de Valliere, Past International Secretary, Committee of Scientific Management, Zurich; (3) Sean Lester, Secretary-General, League of Nations, Geneva (now being handed over to UNO); (4) Dr. Lester B. Struthers, European Secretary, Rotary International, Zurich; and (5) David Vaage, Chief, Safety Section, International Labour Office, Geneva.

The next step will be to get a five-man committee selected in France. Indeed, it is most interesting and stimulating to help bring this "idea" to life.

In Belgium there is a good monthly medical journal called *Belgium Archives of Social Medicine, Hygiene, Industrial Medicine and Forensic Medicine*, edited by Dr. Maurice De Laet, Ministry of Public Health. Arrangements have been made for Dr. De Laet to negotiate with Drs. C. O. Sappington and W. A. Sawyer, respective Editors of INDUSTRIAL MEDICINE and *Occupational Medicine* in America, in order to complete an exchange of associate editorships and an agreement to reprint articles from each other's journals each month. As was previously reported, similar arrangements have been made for Scandinavia. It is hoped, also, that such an exchange may be worked out next for France. A talk with Dr. Donald Hunter (vacationing in Switzerland) leads me to believe that Great Britain will be ready for a similar exchange soon. Hence, by the time I complete this European trip, the spade work will have been done to make it possible for the two American journals to start a "foreign Section" which will bring the best in European thought to the American industrial doctor and the best in American thought to Europe (plus "glory" to the respective editors who will appear as associate editors of each other's journals).

In my first letter I mentioned that I had compiled an "American Mailing List" of professional friends (industrial doctors, psychologists, engineers, educators, etc.) to give out to similar people in Europe with the request that they send their materials to America. By this time, I should think, a carload of material must have been sent as this "List" has been distributed "everywhere." But, remember, this is to be a reciprocal action and when I return to America in February I will have compiled an "European Mailing List" to hand out so that American materials may be sent throughout Europe.

As to my forthcoming book on "The Worker and His Job," I have gathered several hundred pounds of reference material and, as in other countries, have arranged for introductions to the chapters on the countries visited this month to be prepared by: (1) Belgium: G. Henri Francx, Engineer, Director of Personnel Research, Solvay Works, Brussels; (2) Holland: Dr. Jef Herold, Psychologist, Heerlen; (3) Italy: Professor Francesco Vito, Professor of Economics, Catholic University, Milan, and Editor, *International Review of Social Sciences;* and (4) Switzerland: Professor R. de Valliere, Engineer, Director, Institute of Scientific Management, Federal Technical University, Zurich. With these gentlemen added to the excellent list of experts who will be preparing introductions to the chapters on the various countries, my book is bound to be a success in spite of my shortcomings.

It may interest you also to know that "Dear Charlie" is being translated and published in the nine countries I have visited so far, in some countries in more than one journal. This makes it possible to gather a wide range of reaction, especially as to the proposed "International Conference on The Worker and His Job." In Europe, comments will be collected by the respective European journals and forwarded. In America, it would be very much appreciated if you would send your reactions to me in care of Dr. C. O. Sappington, Editor, INDUSTRIAL MEDICINE, 330 South Wells Street, Chicago, Illinois.

Finally, I would like to tell you about my one day of rest since I left home five months ago. In Switzerland, located near the south-eastern end of Lake Geneva, is the city of Bex. Here you change to a small electric train which, during the next hour,

Beyond the reach of human fingers

Beneficial effects may be exerted, not just locally but systemically, "beyond the reach of human fingers" in such conditions as arthritis, myositis, muscle sprains, bursitis and arthralgia. That systemic as well as local effects may be achieved by such preparations as Baume Bengué was conclusively demonstrated by the fundamental work of Moncorps, Kionka, Hanzlik, Brown and Scott.

LOCALLY—*at the site of discomfort analgesic relief and a beneficial hyperemia may be readily induced.*

SYSTEMICALLY—*the salicylate absorption promoted by Baume Bengué's methyl salicylate concentration produces systemic effects to reinforce other indicated therapeutic measures.*

Baume Bengué provides 19.7% *methyl salicylate,* 14.4% *menthol in a specially prepared lanolin base.*

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climbs practically straight-up to the city of Villars. From a peak near Villars, you look out upon the highest of the Swiss Alps and Mt. Blanc (highest in Europe, located in France). For a breath-taking moment at sunset, this snow-covered spectacle changes to an unbelievable glowing shade of red.

Concerned with the safety of the Bex-Villars "skyrocket," a gentleman asked the motorman what might happen should the brakes fail. The motorman explained that there was an emergency brake. "But," insisted the gentleman, "what if the emergency brake fails too?" "Then," said the motorman, "it all depends on how you have lived."

It was in Villars that I spent Christmas in a beautiful large home with Dr. Donald Hunter of London and the family of his Swiss wife, the Bugnions. Mrs. Hunter's parents (past 80) were particularly thrilled with the reunion of 28 members of the family from the four corners of the world. The old gentleman, a retired minister, radiated a sort of spiritual purity and with his white beard and clear blue eyes you were reminded of the meaning of Christmas.

This was a wonderful day for me and I might add that if you lived "right" you need never fear should the brakes fail because in the high Swiss Alps I have seen a preview of heaven and it is magnifique!

My next letter, after visiting France, will come again from London. So, dear Charlie, until then—goeien dag, adieu, arrivederci, uf wiederluege and au revoir!

—BERT HANMAN.

NEWS, COMMENT, OPINION

THE Veterans Administration has announced that Osteopaths will be considered for appointments in the Departments of Medicine and Surgery of the Veterans Administration. We do not know whether this is being done because of pressure through Washington or because there is an actual shortage of M.D.'s in the V.A.—or both.

—*Detroit Medical News*, January 6, 1947.

BRITAIN'S National Health Bill is the obituary of medicine as a learned profession, Dr. K. D. Wilkinson of Birmingham has told members of the British Medical Association. Criticizing the "pink giant," he said, "The practitioner will work a service comparable to the telephone service. He will choose neither where to live, what type of practice to engage in, nor whom to work with." Dr. Wilkinson quoted an appropriate Army saying: "What happens to your patients is of no consequence provided your returns are correct."

—*Medical Economics*, December, 1946.

SOCIALIZED medicine, envisioned for America by the "planned economy" theorists, is reported on in a current scientific study, published by U. S. doctors, of state medicine in Russia, Germany, England and New Zealand.. They report that to place all doctors, dentists and hospitals under Federal bureaucratic control would be to drop our standards of health and welfare into "the appalling quagmire of mediocrity in which we now find it in Germany, England and Russia after years of political medicine."

—*Kings County Chronicle*, Brooklyn, New York, December 27, 1946.

Socialist Medicine

ALL isn't sweetness and light for the Socialist government of Britain, either. Rep. William H. Stevenson, Wisconsin Republican, today read into the congressional record a series of eight satirical leaflets widely distributed throughout England and sent to him by an American army colonel recently returned from London. . . . Leaflet No. 4:

"State doctor:—" 'Now just sit up in bed and sign here, and here and here.

" 'And fill out this form.

" 'And get three neighbors to vouch for it.

" 'And remember the penalties for perjury.

" 'Then I will look at your tongue.' "

—KENT HUNTER, in *Chicago Herald-American*, January 14, 1947.

"MOIST HEAT" IN RESPIRATORY CONDITIONS

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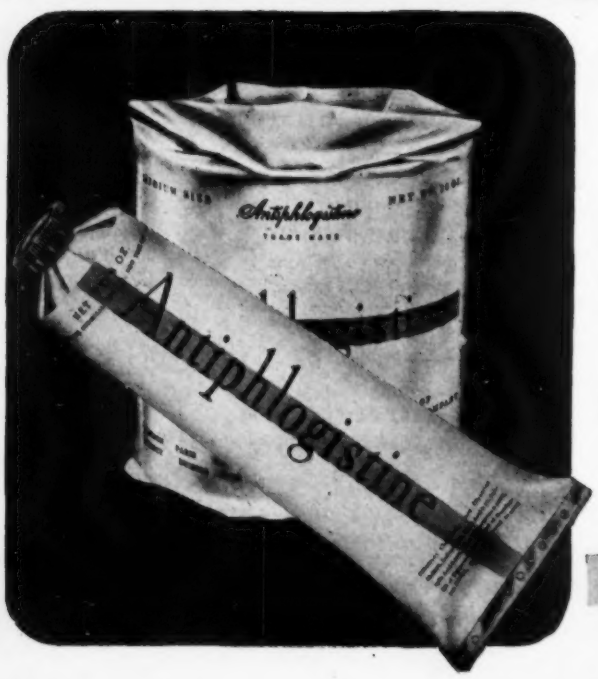

THE moist heat of an ANTIPHLOGISTINE pack is of definite value in relieving many of the troublesome symptoms accompanying affections of the respiratory tract.

Cough—Muscular and Pleuritic Pain—Retrosternal tightness—Soreness of the Chest.

ANTIPHLOGISTINE is a ready to use Medicated Poultice—it maintains comforting moist heat for many hours.

Formula: Chemically pure Glycerine 45.000%, Iodine 0.01%, Boric Acid 0.1%, Salicylic Acid 0.02%, Oil of Wintergreen 0.002%, Oil of Peppermint 0.002%, Oil of Eucalyptus 0.002%, Kaolin Dehydrated 54.864%.

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The Denver Chemical Mfg. Co., Inc., New York 13, N. Y.

Things to Come

IT CANNOT be denied that modern industrial health, with its emphasis on preventive medicine and positive health, does call for as high a degree of training and aptitude as does any other medical specialty. What of the coming years? The enormous impact on modern industry of nuclear physics and chemistry with their attendant hazards, the strong and growing interest in health as a factor in individual and collective security, the trend in occupational medicine towards positive health and physical fitness, the postwar concentration on rehabilitation and selective placement, together with the technical advances in industrial medicine and hygiene, all give sharp emphasis to the importance of medicine in an industrial civilization and strongly suggest the shape of things to come.

—CARL M. PETERSON, M.D., Secretary, Council on Industrial Health, A.M.A., in *Wisconsin Med. J.*, October, 1946.

Oregon Report

AN OCCUPATIONAL Disease Code adopted in Oregon in 1945 has stabilized the functions of the Industrial Hygiene Division. The activities of the Division have been closely integrated with the State Industrial Accident Commission in a cooperative program for control of occupational disease exposure. The functions, general activities, and types of work are described and the work accomplished during the two-year period is tabulated. Completion of 196 surveys and 147 studies is a prominent feature of the report. Cooperation of unions, industry and the medical profession has been good.

—Oregon State Board of Health, Biennial Report 1944-45, in *Industrial Hygiene Digest*, December, 1946.

Antidote

THE ill wind that blew chlorine gas from the German lines across no man's land in World War I and that started a race for the development of more and deadlier chemicals for use in warfare has now blown in some good. During the present war the search for antidotes to neutralize the action of arsenical vesicants, one of the most potent of which is lewisite, has resulted in the discovery of a therapeutic agent that is effective in counteracting the local and systemic effects of poisoning with arsenicals and with some other heavy metals. The agent is 2, 3-mercaptopropanol and has been called BAL (British anti-lewisite). Announcement of the development and properties of this substance has been withheld until recently for reasons of security.

—*New England J. Med.*, quoted in *West Virginia Med. J.*, January, 1947.

Maid and Butler

EMPLOYERS of servants in New York City must now insure their employees under the workmen's com-

Strengthen your eye safety program with WILLSON FeatherSpec

Behind FeatherSpecs there's safety from flying sparks and chips in semi-hazardous jobs such as light grinding, wood working, spot welding.

Large wide one-piece plastic lenses provide high frontal impact strength.

The success of any safety program depends largely upon worker cooperation. And when employees place comfort on a par with protection you'll find the Willson FeatherSpec fills the bill on both counts.

Here is plastic eye protection, less than an ounce in weight, designed primarily for the many semi-hazardous jobs. Workers wear FeatherSpec all day long and hardly know they have it on. The integral, molded-in nosepiece rests lightly on the bridge of the nose while there's plenty of room for wearing prescription glasses.

FeatherSpec lenses are easily replaceable—but in use, are held secure in a sturdy metal suspension-lock frame. The lenses, either crystal clear or Willson Tru-Hue green are free from distortion.

For help with your eye and respiratory protection problems, consult your Willson distributor or write to Willson Products, Inc., 213 Washington Street, Reading, Pa.

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- exerts uniform, controlled pressure without binding.
- has constant elasticity—you don't find it in rubberless bandages!
- *stays put*—no need for frequent readjustments. Affords comfort—because of quick and easy "give."
- is inconspicuous. Women patients will wear it because it's neutral-colored, and doesn't make bulky outlines.
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Patients will appreciate TENSOR; recommend it with confidence.

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pensation law, which has been amended to cover domestics. The new state law covering the state's other 16 cities of more than 40,000 population, applies also to such metropolitan area communities as Mount Vernon, New Rochelle, Poughkeepsie, White Plains and Yonkers. Effective January 1, all employers of servants in these 17 cities will be pecuniarily liable for all injuries incurred on the job by these employees. Under the new law the employers may elect to fulfill their responsibility by paying the recognized insurance premiums under the workmen's compensation law. In that case, the State Board will reimburse all injured or sick domestics. The employer of servants, however, is not obliged to avail himself of the compensation laws, as are industrial employers. In that event the employer is compelled by the new law to assume personal responsibility in the event of any claims by servants. Under the law, a domestic worker is defined as any person employed to give services usual to a household, inside or out, whether it be a private home or an institution, operated for profit or otherwise. Domestic workers on farms are excluded.

—*New York Sun*, December 18, 1946.

To Teach Industrial Medicine

DEAN of the Yale university school of medicine, DR. FRANCIS G. BLAKE, recently announced establishment of an Institute of Occupational Medicine and Hygiene for work in the field of industrial medicine. Primary aims are to: (1) Train students, accepting the premise that occupational medicine is a specialty; (2) Make special courses available to graduate students in medicine, nursing, public health, and engineering; (3) Provide research in occupational medicine and hygiene; (4) Provide assistance and consultation to industrial concerns. The Institute is the result of almost six years of investigation and planning, conducted on the theory that Connecticut, although relatively small in area, is one of the great industrial states of the union, and in need of such a program.

—*Hospital Topics*, November, 1946.

Union Interest in Health

INDUSTRIAL health and hygiene in plants are fast becoming an area of union-management negotiation and possible conflict. By meeting the problems of health and safety hazards frankly, excessive union demands can be averted, and what threatens to be a headache can be turned into a real advantage. Many managements are fearful of inspectors' visits simply because they do not want the union to get new ideas. Two contrasting cases are cited. A strike of crane operators was narrowly avoided at a Ford Motor steel mill. Their complaint was the presence of fumes from chemicals used to hasten steel pouring, but which were annoying but not dangerous. In the other case, Beech Aircraft Company (Wichita, Kansas) invited state inspectors to make a thorough survey of the plant, encouraging them to test all operations and talk to workers. Conditions were found satisfactory, and management and union were commended for their sincere effort to promote health and safety.

—Editorial, *Modern Ind.*, 12:131-132, November 15, 1946, in *Industrial Hygiene Digest*, December, 1946.

At Ford

TYPICAL of the manufacturers who believe in utilizing improved drugs and methods in industrial medicine to assure the health and comfort of employees is the Ford Motor Company. A mobile x-ray unit, manned by trained technicians, designed to x-ray the chests of employees at regular intervals moves from department to department continuously doing this work. The company's industrial health laboratory has produced many protective skin creams for use by workers on jobs where possible skin irritation might arise. According to Ford's figures, 65,000 pounds of these creams were manufactured by the company's own pharmaceutical laboratory. Much has also been done by this company along disinfection

lines. To eliminate dermatitis, such equipment as goggles, rubber gloves and boots, are sterilized at a central disinfection station after the articles have been exchanged by employees. Large electric air cleaners have been installed in areas where manufacturing creates smoke, dust or other atmospheric particles. Many companies, including Ford, have fully equipped hospitals in operation at all times. The use of penicillin and sulfa drugs has reduced the possibility of future disability through infection.

—*New York Journal of Commerce*, November 21, 1946.

X-Rays Profitable

FERRO Machine and Foundry Company spent over $20,000 to install a complete x-ray laboratory in its Cleveland plant so the company's physician could secure an accurate picture of each employee's lungs. The company estimates that the full cost of the laboratory equipment, plus the salary of the doctor, was recovered within two months by eliminating, in pre-employment physical examinations, workers who have either tuberculosis or silicosis in some degree. A foundry which reports a worker disabled because of silicosis finds itself, under Ohio's laws, paying the disabled employee not only $24 per week for the rest of his life (averaging 2½ years), but also tagged with a $7,500 death benefit to his estate. Ferro's management reasoned that it was not only a humanitarian act to keep workers susceptible to silicosis out of the plant but good business as well. And, by screening out men with weak or diseased lungs, perhaps this costly mortality cause could be eliminated from their foundry. Installation of the free lung-testing for all workers was warmly welcomed by employees and union officials.

—From *Business Week*, July 20, 1946, in *Industrial Hygiene Digest*, December, 1946.

NYU-Bellevue Medical Center

NOT the least of the aims of the new medical center is seeking new knowledge of diseases. Plans at NYU call for 14 research institutes in which comprehensive attacks will be made on society's major medical problems. Ranging from heart disease and cancer to industrial medicine, the institutes will cover such things as human reproduction, nervous and mental diseases and rehabilitation and physical medicine. It's comforting to know the forgotten man of medicine is being thought of in the NYU Hospital, the man who earns his bread by the sweat inside his white collar. Private and semi-private care will be offered at what is called moderate cost. And NYU has hopes of working out a pre-payment plan for financing that care.

—From an article by GEORGE KEANEY, in *New York World-Telegram*, December 13, 1946.

COMPANION PRODUCTS . . .
for Urine Analysis—

ALBUMINTEST Tablet, *No Heating* Method for Quick Qualitative Detection of Albumin

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Both products provide simple, reliable tests that can be conveniently used and safely carried by physicians and public health workers. They are equally satisfactory for large laboratory operations. Clinitest is also available in special Tenite plastic pocket-size set for patient use.

Distributed through regular drug and medical supply channels only.

ALBUMINTEST—in bottles of 36 and 100.

CLINITEST—***Laboratory Outfit (No. 2108)*** includes tablets for 180 tests; additional tablets can be purchased as required. ***Plastic Pocket-Size Set (No. 2106)*** includes all essentials for testing. ***Clinitest Reagent Tablets (No. 2101)*** 12 x 100's for laboratory and hospital use.

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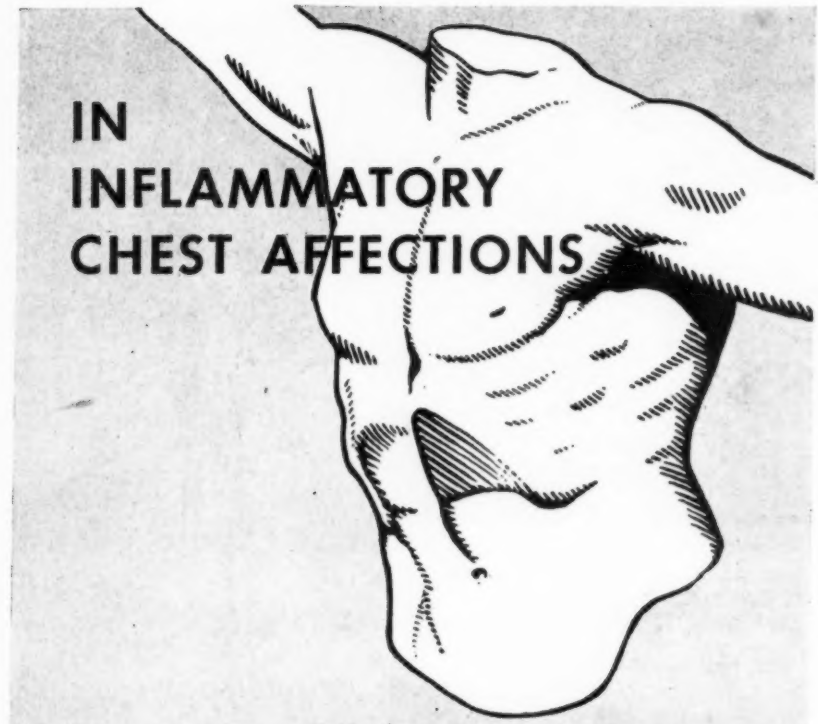
Percentage Legerdemain

A COMPARISON of prewar production figures reveals that the famous "five-year plans" of Soviet Russia do not even touch American production. The claim that the percentage of increase in production in Soviet Russia has exceeded any other country may seem valid until it is realized that 50% of two is only one, while 10% of 100 is 10. But aside from legerdemain with percentage figures, the real discrepancy between production in other countries and in the United States is one of low per capita production in the former, and the highest per capita production of the world, in the latter. American production, per worker per hour, exceeds that of any other country. American capital investment in machinery per worker exceeds that of any other country. In mechanization, under free capitalist enterprise, lies the real reason for our tremendous production. In America, the human factor in production is considered in terms of industrial relations and human relations. Men—that is, sheer manpower alone—are not substituted for machines in industry. The individual needs and the idiosyncrasies of the people as a whole are given every consideration in this country. We are not governed by centralized dictates which may transplant entire communities to Arctic islands or concentration camps for not participating in the economy as outlined by the government.

—From "Let's Look at the Record," by A. M. SARGENT, President, American Society of Tool Engineers.

Railroad Employees

A NUMBER of diseases that may have been contracted in military service are considered in relation



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to employability and rehabilitation. It is pointed out that there is comparatively little opportunity of rehabilitation of injured employess in railroad work, and rules and regulations do not permit special training for an employee to take up new occupations. Unfortunately the Military Services do not give information to prospective employers on a man's physical conditions when discharged. In cases of psychoneurosis it is urged that the veteran obtain a report of his condition to present when applying for employment. Other diseases that offer special difficulties are epilepsy, neuritis, tropical diseases, diabetes, cardio-vascular-renal disease, ocular and hearing defects, varicose ulcers, acute Neisserian infections, and syphilis.

—Report of Committee of Disability and Rehabilitation, Association of American Railroads, in *Industrial Hygiene Digest*, December, 1946.

Men or Mice?

FOR centuries, the doctor has cared for all comers, whether they be criminal or honest citizen, rich or poor, laborer or capitalist. Never has he let personal motives interfere with his duties to suffering humanity, and the nation. Now we see the sick and the doctor together with millions of perfectly well citizens being threatened with denial of the very essentials of life by the purely selfish actions of a few thousands of organized workmen under short-sighted leadership. Should this doctor have a serious difference of opinion with a laborer or a capitalist, he would expect, and be expected, to submit his complaint for adjudication to a court through established channels, while he continued to serve the members of the same group of people involved in the dispute. He would also be expected to abide unquestionably by the eventual decision of the courts. This being true, why should he and other citizens quietly submit to coercion by a small group of labor which is cynically using the force of fear of deprivation of essentials on the part of the general public to further its demand upon some distant individual capitalist employer. If sufficiently provoked, should organized medicine be justified in using the same tactics on behalf of the sick when it is convinced that labor is using unjust means to attain its ends? Medical service is almost a universal demand. Does the helplessness of the really sick justify the temporary assumption by the medical profession of judicial functions which, as in the case of the Pittsburgh power strike, the courts are reluctant to exercise or powerless to sustain? When the authority of the government breaks down, who or what agency, and under what provocation may assume the responsibility for the helpless sick? Interesting? Some day, apparently, the question will have to be answered.

—*Westchester Medical Bulletin*, quoted in *Jackson County Medical Society Bulletin*, December 28, 1946.

The Whole Man

FAITH is not inconsistent with science and when I say this, I do not merely mean the faith which each one of us extends to the other in human relationships but I mean also the faith which each one of us who is not an agnostic or an atheist extends to the God of this universe through the acceptance of our conclusions of the reason and the still more difficult acceptance of the content of His divine revelation. Medicine must reckon with all this. The day is past when medicine was regarded as atheistic; the day is past when the philosophical tenet of medicine was materialism; the day is past when the basic approach of the physician to the patient was through a false broadmindedness which prevented one human individual in his relations with the other from saying what he really thought and believed and when there had to be deceits to cover a fanaticism and a bigotry unworthy of refined and cultured Americans whose basic tenet in life was the acceptance of the first sentence of the American Constitution. All this is deeply related to medicine and we have among medical people today, an outspokenness and a frankness less reminiscent of the days of two decades ago than suggestive of the future program when in words of the motto of one of our great universities "Veritas vos liberabit." We have heard only recently the President-elect of the American Medical Association make his talk on the soul of medicine. We have seen those who have labored most assiduously during the war under the auspices of the Office of Scientific Research and Development make

their pleas for the guarantee of freedom if the Federal government undertakes the subsidization of research in the medical fields. We have heard a quieting of the clamors for the socialization of medicine and more eloquent demands for the liberation of medicine from unwarranted control. We are beginning to hear more and more insistently the insistence upon the integration of medicine through the biological entity which we call man. We are realizing the dreadful import of the diseased mind in the biological economy of man. We are emphasizing not so much the economic losses but rather the human losses entailed by the preponderance of mental and nervous diseases and we appreciate more and more the responsibilities of the physician in neglecting the mind while he treats the body. I am even inclined to say that there are tendencies among the medical men today to pay attention to the soul rather than to ignore it in the approach of the physician towards his patient. All of this means that we seem to be standing at the beginning of a new age, an age of which the whole man, body and soul, mind and emotions, the physical as well as the mental environment will really and truly be drawn within the responsibilities of medicine. All of this, inclusive of the ethical considerations without which the medical man must necessarily fail to live up to his highest possibilities.

From an address by ALPHONSE M. SCHWITTALA, S.J., published in *Texas Reports on Biology and Medicine*, 4:4, Winter, 1946.

Mine Doctors

WHAT is this contract practice that has suddenly become a national issue? Physicians outside the mining areas have long regarded it as something subgrade, a little beyond the pale. Even in the bituminous areas there have been strenuous efforts to have the system abolished; but no adequate substitute has yet been found. Actually, contract practice is one of the oldest forms of pre-payment in the country, a system that has not been modified by principle for half a century. Contract physicians are not company doctors; they are private practitioners who work on panels. Each one contracts jointly with a company and a union local to furnish home and office care for practically all conditions and for all members of the local at the monthly fee of $2 a family. The company agrees to check-off (deduct) the $2 from the miner's pay check and to remit it to the doctor periodically. The other check-off of $2 goes to a contract hospital for hospitalization and specialist medical care. The G.P. does only home and office work. When a patient is hospitalized, he relinquishes the case. Specialists are reimbursed by the hospitals. Thus, the individual miner pays for a compulsory prepayment program which provides him no free choice of either doctor or hospital; he must accept the man and the institution his union chooses. Even the local does not have complete free choice; for while the mining company cannot force the local to accept any particular doctor or hospital, it can refuse to check-off for any man or institution it does not like. The only virtue of this type of "closed shop," say many doctors, is that it tends to keep subgrade physicians, osteopaths, chiropractors, and quacks out of mine practice. Whether it is good or bad in principle, contract practice has been, up to the present, the only practical method of providing medical care for miners. Such care has not always been of the highest caliber, although it has compared favorably with that furnished a number of other industrial segments of the population. Without the check-off, most miners in recent years would have had practically no medical care at all, for they simply would not have paid for it. Miners have long lived in an economic system that does not include the usual American qualities of thrift, self-dependence, and foresight. Vast numbers of them are almost childishly incompetent when it comes to handling money, having not yet advanced far beyond the virtual "peonage system" established by their European predecessors. Although the union eventually abolished the peonage system, a vast number of miners still live in an economic hang-over. They buy the necessities of life, and some of the luxuries, from company stores. They pay reasonable, competitive prices. But no money changes hands; everything is deducted from the paycheck. It is not surprising, then, that a great many miners have come to consider the cash balance as "spending money," something that is meant to buy relaxation and not to

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pay debts. Much of it goes for week-end drinking bouts, relatively little is put aside for the future. Under such conditions, the doctor must collect from the check-off or not collect at all. Private, fee-for-service practice exists in the bituminous areas, but not for miners. The hospital situation is spotty. Within twenty miles of each other, there may be one top-grade institution and one that hardly deserves to be called a hospital. . . . This unevenness of service among the hospitals (most of them privately owned) has drawn the fire of the UMW. It plans to use some of its health and welfare fund to build new institutions. But until recently union locals insisted on complete control of such hospitals, with no public or professional representation on the boards of trustees. Doctors, granting the need for more and better hospitals, have refused to staff institutions under such unilateral control. Are the UMW's demands for a new deal reasonable? Among contract physicians there is some difference of opinion. A few feel that the present system is adequate and should be continued. But most believe that medical service could be improved greatly. They point out that relatively few contract practitioners are young, vigorous, and possessed of recent training; while a great many have been in practice forty or fifty years. Under normal circumstances, the bulk of the work would, by this time, have been shifted to the shoulders of the younger men. Before the war, the contract system did attract a large number of young physicians. They knew that by dint of hard work they could amass in four or five years enough money to establish themselves firmly in more typical American communities. War shortages changed all that. Today, the mining areas are grievously short of enough doctors to make even the present system work satisfactorily. In addition, a number of established men, impatient with the high-handedness of some union locals after the signing of the Krug agreement, have quit contract practice and moved. One local, which made such unreasonable demands upon its doctor that he withdrew, is now forced to get along with an osteopath and to pay him $3 a month per family instead of the $2 it paid its medical practitioner. Evidently, such incidents have alarmed UMW headquarters, for word has been quietly circulated among local officials to "lay off the doctors" for the time being. Contract physicians are in the anomalous position of making more money each year than the average doctor yet of getting a far-below-normal return for each call they make. A contract practitioner with a panel of 1,000 miners and their families will gross about $24,000 a year, but he will work so hard that each call may bring him

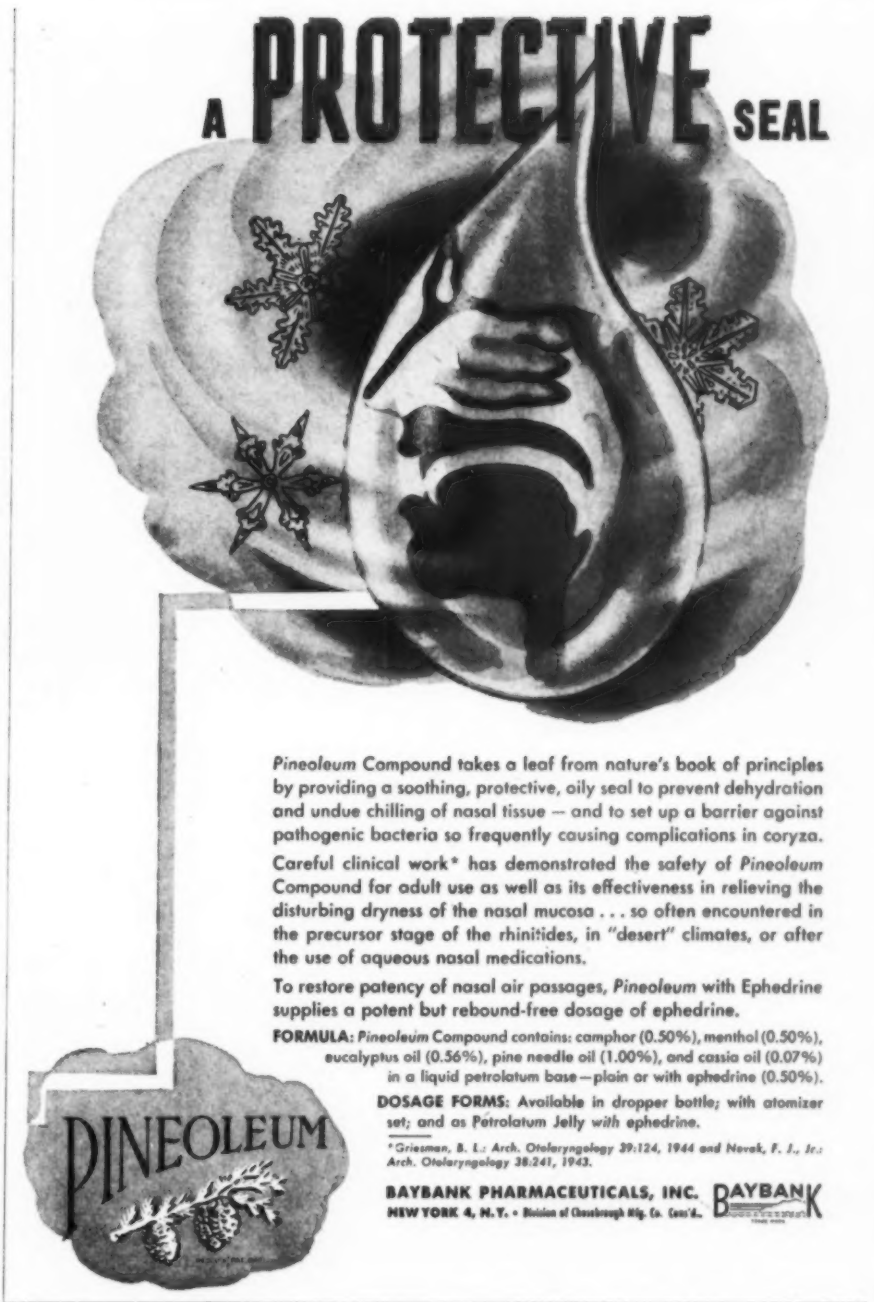
less than 50 cents. At their worst, mining towns are so repulsive that only the most self-sacrificing doctor could work in them. . . . Last month, Navy doctors under the direction of Admiral Joel T. Boone were completing a survey of the medical, hospital, sanitary, and housing conditions in the mining areas —a project generated by the Krug agreement. That their report would be a dismal one, few people doubted.

—KENT BARSTOW, "John Lewis vs. The Doctors," quoted from *Medical Economics in Public Health Economics*, December, 1946.

The Career Angle

UNLESS you're going to make it your life's work, stay out of a full-time job," those in the industrial field advise. They say that a few years as a salaried employee can ruin a man for private practice. The majority recommend part-time work—some contending that it aids in the building of a private practice. Others declare that the man who has the proper training and devotes his full time to industrial practice can find plenty of opportunity. Most industrial doctors find the lower-income groups interesting to work with and highly cooperative. It is pointed out, however, that the ratio of malingerers is high—and a nuisance; that personal conflicts among workers, particularly women, constitute something of a headache; that some patients have little respect for "the company doctor," and often argue about their ailments after "shopping" for outside medical advice; and that industrial practice is obviously no place for the physician who does not wish to care for Negroes. In the larger plants, medical departments are usually well equipped and adequately staffed. During a business slump, however, a company may be reluctant to purchase needed apparatus, or it may try to get along with too few doctors, nurses, technicians, and secretaries. Some smaller plants provide adequate space and equipment, but skimp on salaries or personnel. But geenrally facilities are better than the average private practitioner could hope to maintain in his own office. Management policies vary greatly. Some officials follow a hands-off policy with the medical department, giving the doctor wide leeway in such matters as the granting of sick leave with pay, the placement of handicapped persons, and reduction of absenteeism. In other plants, a doctor's decision may be overruled by the personnel department. As a result, some practitioners claim to be at the mercy of the higher-ups. Others insist that management needs only to be convinced that the doctor is working for the plant—not against it—in recommending measures to improve the employees' health. The truth of the matter is that the physician must please both groups—management and workers—a circumstance which requires an unusual degree of tact. Just where the company doctor's responsibility ends and the family doctor's begins is often a sore spot. The situation becomes involved if a patient comes to prefer the plant physician. Should the latter happen to be a part-time private practitioner, he may be accused of pirating patients. In states where workmen's compensation laws do not allow free choice, an injured employee may be required to use the company doctor—who may soon find himself being called "unethical" by local physicians. The industrial practitioner can best adhere to the code by limiting his work to preventive care, diagnoses, and first-aid treatment; by referring all possible cases to the family doctor; and by maintaining a friendly relationship with all local M.D.'s. In the past, many doctors—feeling that acceptance of salaried work implied a lack of enterprise—were inclined to look down on industrial practice. Some still do—including part-time men in the field who regard industrial practice as a stop-gap. This fact, together with the claims of patient-pirating and a general impression that a large number of incompetents are doing industrial work, placed a certain stigma on the specialty. But the stigma is disappearing. More and more medical schools are featuring courses in industrial medicine, and the number of men specially trained for the work is mounting. Salaries were increased greatly during the war, and this has attracted more high-caliber men. The specialty shows every indication of achieving equal status with the older practice categories.

—NELSON ADAMS, "Industrial Practice, 1946," in *Medical Economics*, July, 1946.



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*Griesman, B. L.: Arch. Otolaryngology 39:124, 1944 and Novak, F. J., Jr.: Arch. Otolaryngology 38:241, 1943.

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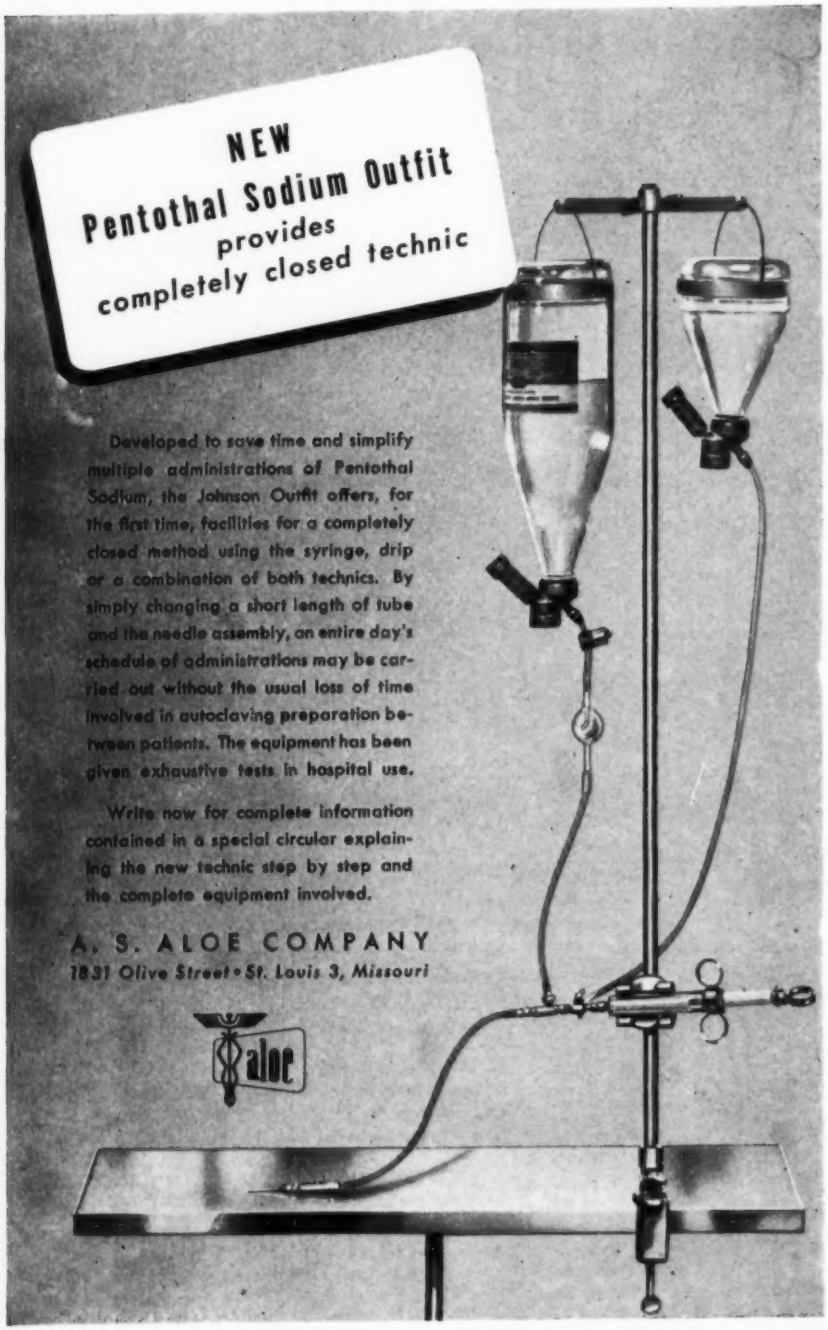
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Communism in War Department

SOME weeks ago, I came into possession of a copy of War Department Education Manual EM 763—Economics: Principles and Problems—in two volumes. As I read here and there in these volumes, it became more and more apparent that there was something very definitely haywire. So you may get an idea of what I mean, here's a sample of the contents, quoted from page 521, Volume One: "The Abolition of Inheritance.—Our goal, then, is equality of opportunity such as we have just described. The first move in this direction, we believe, should be the adoption of a thorough-going Federal estate tax which will prevent the piling up of wealth for the use of individuals, and will insure its expenditure in the interests of all. If this tax is to do its full share in reducing inequalities, it must take a very large proportion of a man's estate upon his death, leaving for the heirs (apart from a modest provision for direct dependents) little more than mere keepsakes, which are valued chiefly for sentimental reasons. This arrangement would take from the children of the wealthy the advantage they now enjoy through the inheritance of property which places them economically far in advance of those who have not chosen their parents so shrewdly. There is much to be said for shuffling the cards between deals, and for having all runners in a race start from the same point. It is equally important in the race of life that contestants should get an even start, in so far as the elimination of artificial obstacles is concerned. If inheritance of income-producing property were abolished, we should have at least a chance to judge fairly the qualities of the racers—a chance which is non-existent today under a system that often penalizes the weak and favors the strong. It is scarcely necessary to add that an estate tax, if it was not to be evaded, would have to be accompanied by a gift tax which would prevent the transfer of property in anticipation of death, or would at least tax such transfers at a high rate." How do you like that? Pretty bad isn't it for our War Department to be a party to teaching economic theories which, if adopted, would utterly destroy individual incentive, one of the principle factors which enabled this country to outstrip every civilization the world has ever known. I used the above quotation in speeches in St. Louis, Los Angeles, San Francisco, Washington, Chicago and other places, but did not release the quotation to the press until I spoke in Washington on October 4. The wire services picked it up and spread it to practically every daily paper in the country. This publicity, coupled with the storm of protest which descended on Congress and the War Department from those present at the other meetings, resulted in the War Department withdrawing Education Manual EM 763. It may be that withdrawing the Manual is supposed to quiet the rising tide of criticism. Perhaps it will to some extent, but it won't shut me up. I'm going to continue talking about this Manual until a Congressional investigation has been authorized to make a thorough investigation of the whole War Department educational program and the personnel in charge of that program. What I want to know and what the American people want to know is how and why our War Department ever went in for teaching Communism. Also, we want to know that even though Education Manual EM 763 has been withdrawn, there aren't one or more other manuals still in use which are just as bad, if not worse.

—DEWITT EMERY, President of the National Small Business Men's Association, quoted in *Weekly Bulletin of Jackson County (Missouri) Medical Society*, December 14, 1946.

Glycols and Ultra-Violet

DURING the past few months, several articles have appeared in the public press relative to the possible efficacy of glycol vapors and ultra-violet radiation in reducing certain infectious diseases, particularly upper respiratory diseases, such as the common cold. Owing to the fact that many inquiries have been made as to the possibility of using one or both of these methods in public buildings, it is felt that a statement at this time should be made concerning the use of such

installations. Committees of the National Research Council and the American Public Health Association have studied and reviewed the data on such installations. Within the past several weeks, these two Committees separately have submitted reports. Both Committees feel that the use of either glycol vapors or ultra-violet radiation is still purely in the experimental stage and that the data collected so far do not warrant the installation of such equipment in public buildings and industry in the hope of cutting down upper respiratory infection. The U. S. Public Health Service, through its research organization, the National Institute of Health, has conducted rather extensive studies on both glycol vapors and ultra-violet radiation and fully concurs in the reports and recommendations made by the Committees of the National Research Council and the American Public Health Association. It must be emphasized that direct unshielded ultra-violet radiation of sufficient intensity to kill micro-organisms in the air is also harmful to the eyes and exposed skin of humans. These observations are not intended to indicate that the future will or will not disclose new public health values in the application of either glycols or ultra-violet radiation. Much experimentation is needed, however, before a decision can be made as to whether such application may or may not be warranted.

—Statement of DR. R. E. DYER, Director, National Institute of Health, in U.S.P.H.S. Release, January 5, 1947.

Los Angeles Program

YOU are aware that the industrial health program of Los Angeles has received national commendation. The program is one which was established as a result of the efforts of an industrial health advisory council formed in war time. This organization made up of representatives of industry, official agencies, and the medical, dental and nursing professions, was coordinated by MR. FRANKLYN COLE, of the local Chamber of Commerce. It stimulated and promoted interest in health in industry and has been responsible for considerable expansion and active participation in health activities by industrial management. But, except for sporadic and occasional requests by small industry for assistance from official agencies, establishment of basic services has been accomplished only in the larger size plants, and only in a fraction of these. Nevertheless it has been demonstrated that industry can be reached and coordinated for health, through an effective organization. On the other hand, how can physicians be induced to engage in a small plant health program? How can the services of those already so engaged be improved, how can new physicians from the younger general practitioners be recruited and indoctrinated in the principles and opportunities of industrial health? I do not think the obstacles are insurmountable. I believe that the Los Angeles Chamber of Commerce has the machinery for localizing areas of small plants either on a basis of like industries or on a basis of physical or geographical proximity. I believe that representatives of such small plant groups can be sounded out on their willingness to participate in a group industrial health service. I believe that they can be organized so that an over-all picture of their industrial health problems can be formulated, based on the various types of occupation, the hazards involved, and the environmental studies needed. On the other hand, I believe the Industrial Medicine Section of the County Medical Association should agree on what the policy of its organization will be in relation to an accepted definition of the objectives and scope of industrial health and medicine. With a clearly defined policy, members who are not full-time industrial physicians, should be able to submit an estimate of the extent to which they could expand their activities in the direction of industrial health practice. Those whose time was fully occupied with existing industrial commitments should consider the employment of younger medical men, either as full- or part-time assistants. And these younger men should be recruited from the general membership of the association by intercommittee work between the industrial and general association membership. Committees already established in both the medical and industrial organization could then find a point of agreement.

—From "The Industrial Physician in the Community Health Program," by A. V. NABATIR, M.D., *in California & Western Medicine*, June, 1946.

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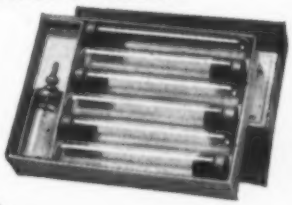

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Indiana Industrial Conference

INDIANA State Medical Society Committee on Industrial Health, Indiana University School of Medicine Department of Public Health and Indiana State Board of Health Division Industrial Hygiene are sponsoring Indiana's Third Industrial Health Conference, to be held at Indiana University School of Medicine, Indianapolis, April 16, 1947, with the followng program:

Morning Session

PRESIDING: JOHN VAN NUYS, M.D., Executive Secretary, Indiana University School of Medicine.

Opening Remarks: E. S. JONES, M.D., Chairman Committee Industrial Health, Indiana State Medical Association, and T. B. RICE, M.D., Professor of Bacteriology and Public Health, Indiana University School of Medicine.

"Indiana Workmen's Compensation Laws"—MR. JOE MILLER, Chairman, Indiana State Industrial Board.

"Disability Evaluation"—HENRY H. KESSLER, M.D., Member of the Council on Industrial Health, American Medical Association, Newark, New Jersey.

"Industrial Diseases of the Chest"—L. E. HAMLIN, M.D., Medical Director, American Brake Shoe Company, Chicago.

Afternoon Session

PRESIDING: L. E. BURNEY, M.D., Secretary, Indiana State Board of Health.

"Industrial Dermatoses"—L. F. WEBER, M.D., Associate Professor Dermatology, University of Illinois College of Medicine, Chicago.

"Toxicology of Heavy Metals"—DR. LAWRENCE FAIRHALL, U. S. Public Health Service, Washington, D. C.

"Control of Upper Respiratory Diseases"—DR. ANNA BAETJER, Assistant Professor Physiological Hygiene, Johns Hopkins University, Baltimore.

Cook County Health Survey

COOK COUNTY'S half million peacetime industrial workers, who produce far more dollars' worth of goods than the average state, lack adequate health attention, according to a report issued today by the Chicago-Cook county health survey. The report on industrial hygiene, prepared by the U. S. Public Health Service, is based on a study of 1,399 of the county's more than 9,000 industrial plants that give jobs to 543,878 men and women. While the deficiency is general, the report says, it is greatest among the multitude of smaller plants. These employers are enjoined, both morally and as a matter of good business, to pool resources to bring health aid and education to their workers. The report proposes an official agency for small industries, to work with public, semi-public, and private health organizations in spreading physical welfare benefits among all factory employees and particularly those exposed to occupational hazards. Management and labor share responsibility for protecting and promoting man power well-being, the survey holds. Only 29 of the plants studied were found to employ full-time physicians, and none of these had fewer than 1,000 workers. Of the 90 factories with part-time physicians, only two had fewer than 100 employees. Half the plants were completely without physicians tie-ups. Only 17% of the plants had registered nurses, half of whom were employed by the 33 largest. About 75% of the plants had no nursing services. Health studies have brought out, it was emphasized, that industrial employees, besides being subject to special occupational ailments, also have more non-occupational disease and a shorter life span than other workers.

—*Chicago Tribune*, Sunday, January 19, 1947.

The Buffalo Conference

THE BUFFALO Conference—thirty-second annual meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, combined with the AMERICAN ASSOCIATION OF INDUSTRIAL NURSES, the AMERICAN INDUSTRIAL HYGIENISTS ASSOCIATION, the AMERICAN CONFERENCE OF GOVERNMENT INDUSTRIAL HYGIENISTS, and the AMERICAN ASSOCIATION OF INDUSTRIAL DENTISTS, at Hotel Statler, April 29 to May 2, 1947, will offer some unusual program features. At this writing "it appears that there will be a rather lengthy discussion of the Bikini experiment with numerous phases of the atomic bomb problem, particularly those which would be pertinent to physicians and hygienists." And it is anticipated that "an excellent day of clinics is to be conducted under the leadership of DR. JAMES H. LEWIS, probably at the medical school or at some Buffalo hospital. This will occur on Tuesday, and then on Wednesday the joint meeting together with the Bikini talk for all the groups. Wednesday afternoon we will have some discussion regarding the teaching of industrial medicine in the various medical schools and the annual meeting of the Association. Thursday will be a full day of scientific and professional papers with probably at least one round table discussion."

From the Newspapers

CHEMICAL Bank & Trust Company, New York, had $514,032 less net operating earnings in 1946 than the year before. The difference, Frank K. Houston, chairman, reported to stockholders, was much less than the increase in payroll. Employees' welfare in itself cost $483,847, he said, and for the current year free hospitalization has been added (*New York Sun*). . . . GOVERNOR DEWEY, of New York, says the state has made great progress "in the reduction of accidents." But the chairman of the Workmen's Compensation Board has just reported that industrial accidents in the state reached an all-time high of 718,333 in 1946, with "an almost steady climb" throughout the year (*New York Times*). . . . A STAFF of 182 people are employed in Rouge Hospital and 21 emergency first aid stations maintained for the 70,000 workers of Ford Motor Company's River Rouge Plant (*Newsweek*). . . . INTERNATIONAL Ladies Garment Workers Union, AFL, is establishing a health center at Allentown, Pennsylvania (*New York Women's Wear*). . . . THE AMA's eighth Annual Congress on Industrial Health will be held in Detroit, October 8-10, 1947 (*New York Herald-Tribune*). . . . NEW YORK City's firemen "will be able to patronize the department's own dentist if the Board approves Item 146. The proposal is to establish the position of dentist at $3050 a year in the departmental clinic. An x-ray technician at $2160 likewise is urged" (*New York Sun*). . . . ARNOLD'S Brick Oven Bakery, Port Chester, New York, has a number of employee services, "the cost of which is shouldered completely by the company." Among them: "Free medical care—this includes office and home visits by the doctor for every member of the employee's family" (*New York Sun*). . . .

Colds

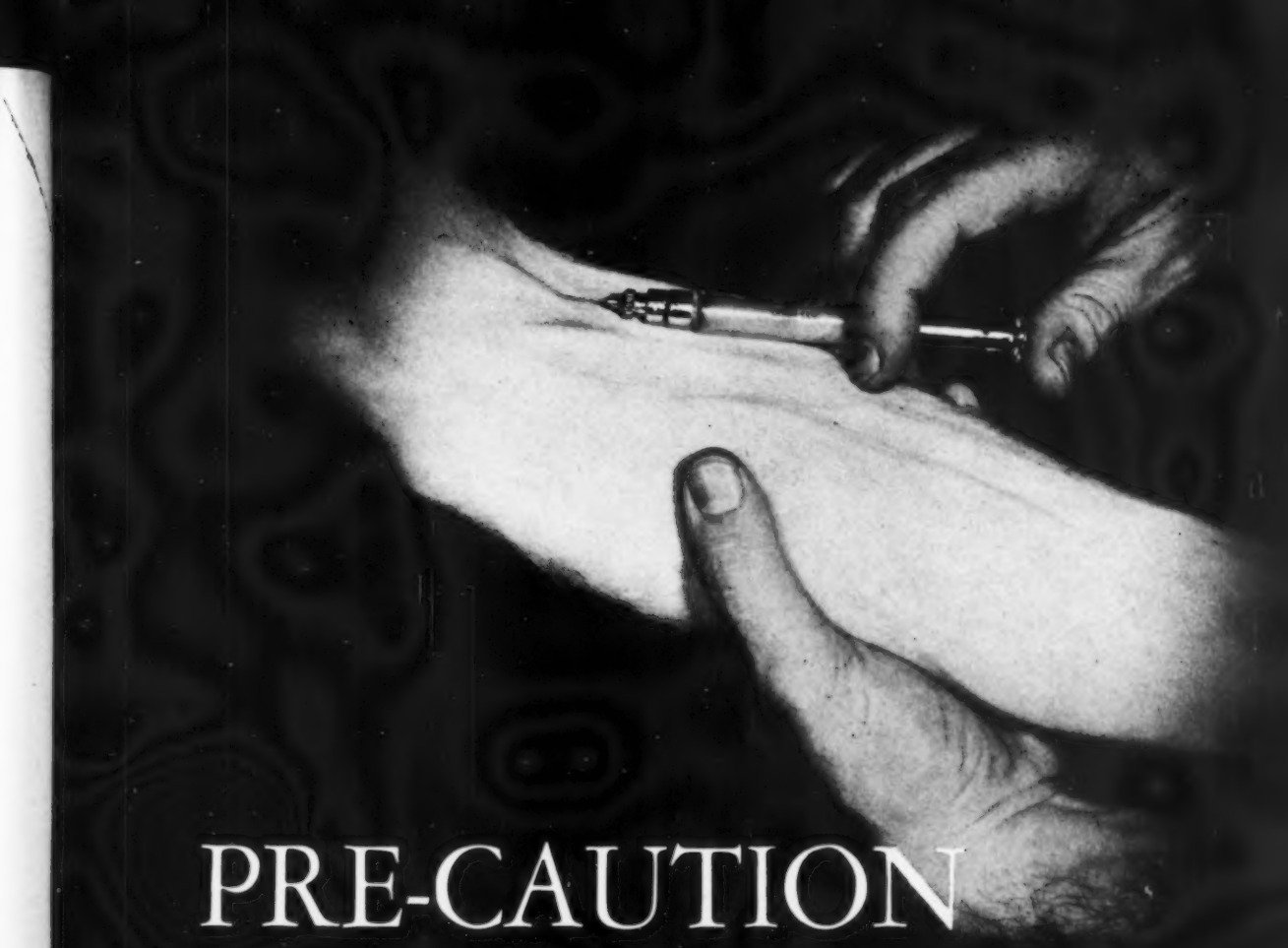
YOUR doctor should be consulted as soon as a cold develops. A fever accompanying either a head or chest cold can lead to other complications. Rest in bed seems to be the best treatment for a cold. Keeping the body warm is one of the salient features in caring for a cold. Remaining in bed serves two purposes—it keeps the infection from spreading through nasal discharges, caused by sneezing or coughing—and it assists the victim of the cold germ to maintain an even body temperature, preventing chilling.

—Illinois State Medical Society Release.

DR. PILGRIM

—*Continued from page 6.*

talked on "Appraisal of Dust Exposures with Relation to Silicosis," which meeting was well attended and discussions important. . . . AND a luncheon group, being a subcommittee on industrial hygiene for the program of the Midwest Safety Conference scheduled for the spring, at which were present WARREN COOK, HERBERT WALWORTH, KENNETH MORSE, ARVID TIENSON, DON STIER, and HERBERT WEBER. . . . AND then at the desk and concerned with the correction of proceedings of meetings which occupy a great deal of time but nevertheless are of great import, and occupied also with editorial notes, and the correction of galleys, and meetings of engineering organizational and technical facilities. . . . AND bowling, with the greatest improvement shown in many years, with difficulty in finding the cause—albeit glad to know there was one. . . . AND occupied with the reading of a large group of chest films and comments on their significance, and browsing in the reports of various industrial hygiene surveys made in different parts of the country. . . . AND concerned with formulation of messages of tribute and sympathy, admixed with work on meeting publicity. . . . AND finding the desk sessions covering an extensive period, which is unusual, and so preparing for sojourns in Wisconsin and Missouri, of which more in later notes. . . .



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